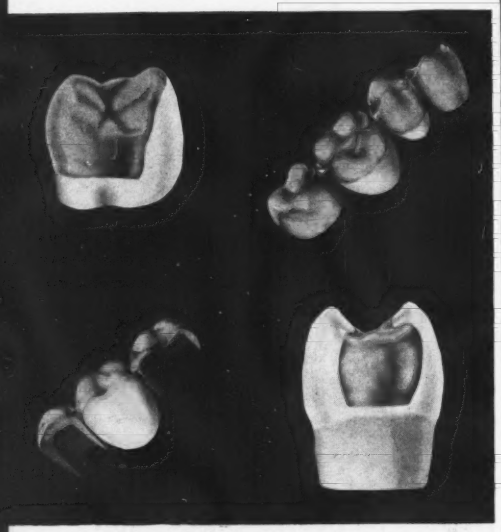
The DENTAL DIGEST

October
1933

HIGH PLATINUM = A Safety Margin in Strength and Hardness



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BAKED PORCELAIN RESTORATIONS IN COMBINATION WITH GOLD

L. Z. McCLUNG, D.D.S.
Birmingham, Alabama

FOR the past few years ceramists have endeavored to produce a porcelain sufficiently strong to act as an abutment material. All-porcelain bridges and approximo-incisal restorations have proved, at best, a risky procedure.

Gold manufacturers have failed to produce a white gold that would compare with porcelain esthetically. The following techniques are offered as a remedy with the hope that baked porcelain and gold will be perfected to the point that a combination of the two materials will not be necessary.

Abutments
(*Figures 1 to 6 Inclusive*)

Preparation—Fig. 1 needs no explanation beyond the fact that the labial (visible) area is that of a jacket preparation. The lingual part of the preparation (*a* to *b*) is that of a three-quarter gold crown. The width of the shoulder on the labial (*a* to *b*) will depend on the shape and condition of the labial surface of the tooth. It will be noted that the junction of the labial and lingual preparation forms the necessary retention for the gold backing (Fig. 2).

If the tooth is badly broken down a pin may be used to advantage, with its anchorage in the cingulum.

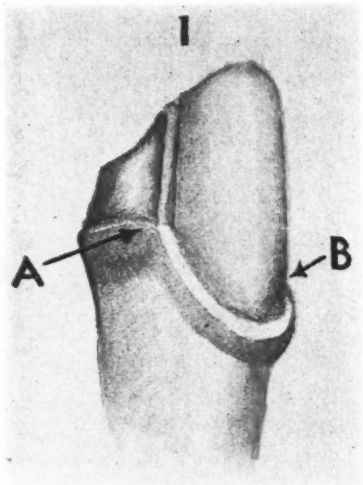

Fig. 1—The labial part of the preparation is that of a porcelain jacket crown. A three-quarter gold preparation is used on the lingual portion. The junction of the two forms the necessary retention for the gold backing.

Fig. 2—Gold backing in place. Although the illustration does not bring it out, the pin holes should be angled, so that the heads of the pins (Fig. 4) will be engaged by the porcelain in the most bulky area.

Matrix Technique—1. The holes in the gold backing are angled in order that the heads of the pins (Fig. 4) will be engaged in the thickest portion of the porcelain facing.

2. With the gold backing in place on the amalgam die, embed in modeling compound.

3. The matrix of the thinnest possible platinum is adapted.

4. Holes are punched through the matrix corresponding to the holes in the gold backing. The pins are placed in holes which will withstand the fusing point of the porcelain used.

5. Flow sticky wax carefully into the matrix, remove (Fig. 3), and invest with high temperature investment.

Baking Technique—The facing is baked according to the porcelain inlay technique. The opaque porcelain technique is used so that the gold will not reflect through the facing.

In case the facing does not fit the backing, which is seldom the case, one need not make a new facing. The gold backing is discarded, the facing alined with the pontics, and a new backing is cast to the facing.

Transfer Technique—An accurate transfer technique of the die to the cast must be used. The following one is suggested which requires only five minutes to accomplish:

A second impression of the stump is taken with copper tube and modeling compound. A die is secured with a putty-like mix of cement; a matrix of number 60 tin foil is folded. A drop of bite wax is placed within this matrix and carried to place on the stump. Flow a drop of sticky wax on the labial and lingual surfaces of the tin foil matrix; a plaster impression is taken and the impression is removed before the plaster has set to the point that it will not remove from undercuts. The thin film of wax within the tin foil matrix will allow the die to seat in case there is a slight discrepancy.

Advantages—The advantages of this abutment are that (1) it possesses as nearly as possible the esthetics and gingival tolerance of a jacket crown, and (2) it will withstand the stresses of the maximum number of pontics.

Baked Porcelain Inlay Restoring the Incisal Angle
(*Figures 7 to 13 Inclusive*)

The technique used may appear to be complicated; however, in those cases in which the lost portion of the tooth must be restored with a baked porcelain inlay, it has been my experience that the additional time necessary to produce the lingual gold pro-

Fig. 3—Platinum matrix ready for investing. Sticky wax is melted into the labial area.

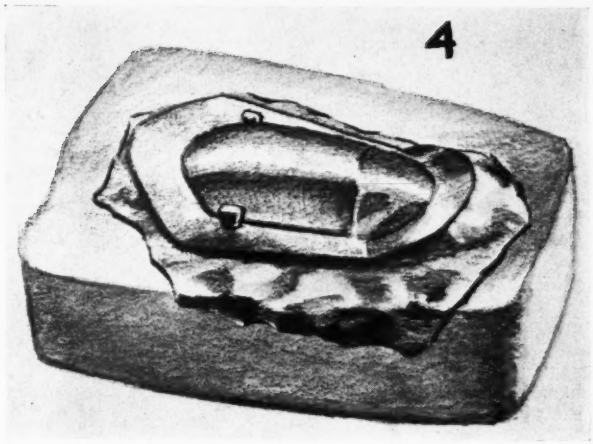

Fig. 4—Case ready for baking. The wax is dissipated from the platinum matrix by slowly heating in the muffle of furnace.

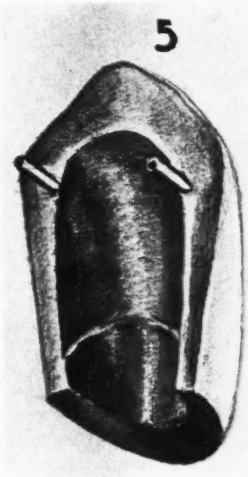

Fig. 5—Porcelain facing completed.

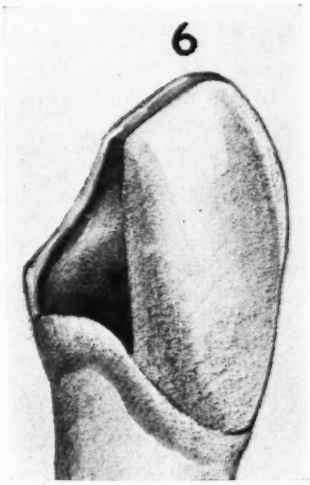

Fig. 6—Facing in place on the gold backing.

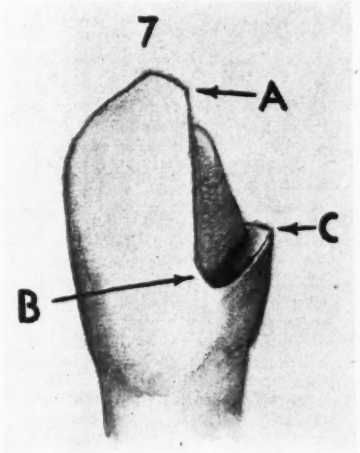

Fig. 7—Cavity preparation for porcelain and gold restoration for the labial surface. Square angles should be avoided. A countersink should be made in the gingival floor, a round bur being used.

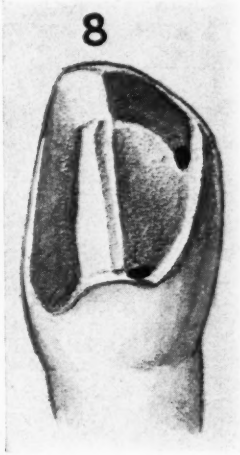

Fig. 8—Method of securing retention for the gold backing on the lingual surface.

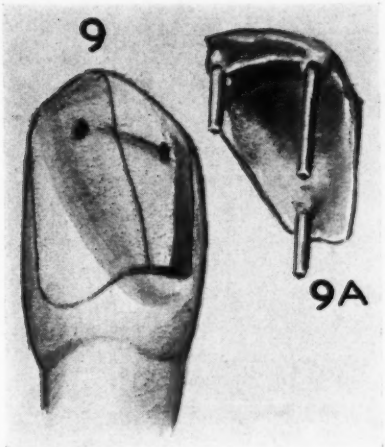

Fig. 9—Porcelain inlay in place without platinum matrix; ready to receive the gold backing. The porcelain inlay is retained at its incisal end by a pin from the gold backing. The gingival end of the inlay is anchored by a countersink in the floor of the cavity.

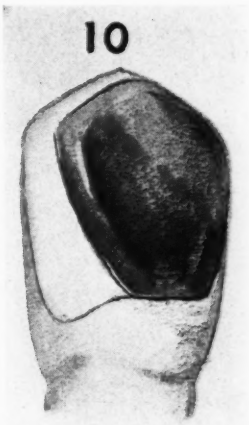

Fig. 10—Porcelain inlay and gold casting in place on the tooth. Hard gold should be used for the backing.

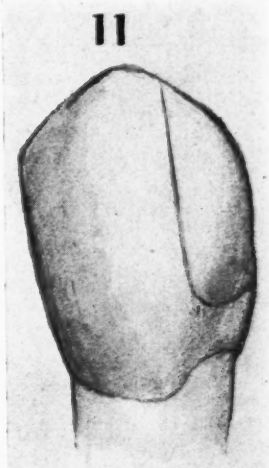

Fig. 11—Labial view of the porcelain inlay. The technique described does away with the cement line between the tooth and inlay.

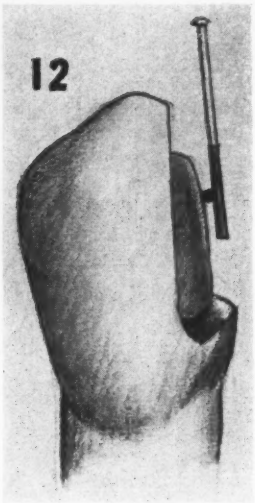

Fig. 12—Method of attaching a tube of platinum to the matrix. The smallest amount of sticky wax is used and the pin removed before baking. The tube should be parallel with the holes in the tooth, although this is not absolutely necessary.

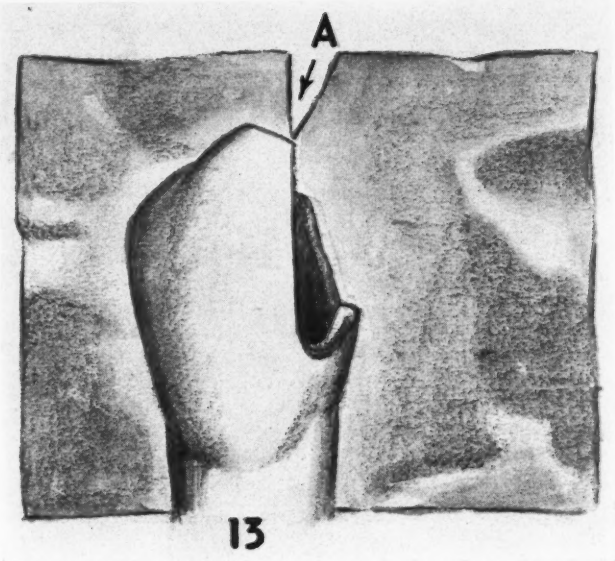

Fig. 13—The cut at A in the platinum matrix should be slightly away from the angle. Fold the matrix as for a porcelain jacket, using 1-1000 foil. Investment of the matrix is unnecessary. Wrinkles should be avoided in the matrix.

tection is well spent. This requires only one hour's additional time for casting with only a few minutes for waxing, and if the following technique is carried out, two important points are accomplished: (1) a porcelain inlay with perfect margins is obtained (elimination of the cement line ordinarily produced), and (2) a baked porcelain inlay that will not fracture in the most unfavorable bite, provided hard gold is used for the backing, is obtained.

Cavity Preparation—The outline of the cavity on the labial surface should be a straight line from *a* to *b* shown in Fig. 7. From *b* to *c* the gingival outline should continue in a rounded form, sharp angles being avoided. A countersink is produced in the gingival floor for retentive purposes. On the lingual, two shallow holes are sunk as in Fig. 8, *d*. The preparation may be extended to the approximal surface, and the casting used as an abutment piece.

Matrix and Baking Technique—The matrix is secured by the same method as that used for a jacket crown, with the tinners joint made opposite the cavity. Care must be taken in slitting the platinum (Fig. 13, *a*). The end of the slit should be slightly distal to the angle as at Fig. 13, *a*.

Incisal retention is accomplished by folding a thin piece of platinum around an ordinary pin, the same gauge being used as in the gold backing (Fig. 12). The tube need only be extended a short distance in the porcelain inlay.

With the tube around the pin (Fig. 12) it is made to adhere to the platinum matrix with the smallest amount of sticky wax. The pin is removed after the first application of porcelain. The inlay is fused and finished according to the inlay technique for baking.

Waxing Technique—The platinum is stripped from the porcelain inlay and stuck or held securely to place on the die. The pins are placed in each of the three holes and the inlay wax is forced (*not melted*) to place.

Remove, cast, and cement the inlay and backing simultaneously.

Advantages—The advantages of this restoration are as follows: (1) A baked porcelain inlay with perfect approximation to the tooth; (2) a restoration that may be placed without fear of fracture, and (3) the gold backing may be extended to become an abutment.

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THE MANIPULATION OF AMALGAM

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AMALGAM today is the most extensively used dental filling material in the restoration of lost tooth structure, and because of the ease with which it can be manipulated it has also become the most misused material. The dental practitioner has allowed himself to neglect the fundamentals of correct amalgam procedure, and because of this neglect many amalgam restorations have been unjustly considered failures. In the light of this fact the blame must be placed on the operator, and not on the material.

The most important factors that enter into the so-called failure of amalgam fillings are shown in table 1. From an examination of 1000 extracted teeth having amalgam fillings the following conclusions were obtained: 87 per cent showed the lack of proper cavity preparation; 89 per cent showed poor anatomic carving of the restoration; 90 per cent were poorly finished; 62 per cent represented poor condensation of the amalgam; 48 per cent had no cement base where indicated.

In examining representative restorations of various types from the thousand teeth examined, the operators' neglect of the principles of cavity preparation and a proper amalgam technique was readily seen.

Incorrect Restorations

In Fig. 1 the occlusal outline of the cavity does not eliminate the natural defects in the grooves on the occlusal. The buccal cavity preparation is poor in outline and extension with recurrent decay at the gingival.

In Fig. 2 the proximal occlusal type shows clearly the neglect of proper extension and outline of the cavity preparation, the failure to use a matrix with proper location of the contact point, and the neglect to use a wedge to give adaptation of the matrix to the gingival of the cavity preparation. Poor condensation of the amalgam, poor anatomic carving and finish of the restorations are also clearly noted.

From this analysis it is seen first of all that proper cavity preparation has been neglected. This is the foundation for and the success of the amalgam restoration and should be carried out in detail. If the cavity preparation of the gold inlay or gold foil were so badly neglected, the restoration could probably not be placed.

Pit and Fissure Cavity Preparation

In Fig. 3 the occlusal view of the occlusal cavity preparation is shown. In this view the extension of the outline of the cavity includes the mesial, central and distal pits together with their grooves but still preserves as much as possible the triangular ridges under which portion the occlusal retention is placed as shown by the dotted lines. Buccal and lingual extensions of the buccal and lingual groove onto either the buccal or lingual surfaces to eliminate the natural defect is sometimes necessary. Fig. 4 represents a cross section of the same cavity cut from mesial to distal. Here it will be noted that the mesial and distal extension of the cavity terminates half way between the crest of the marginal ridge and the depth of the pit. The depth of the cavity is from one-fourth to one-third into the dentine; the enamel walls are parallel or slightly tapered outward to the occlusal; one always follows the general direction of the enamel rods. The floor of the cavity must be

TABLE I

Results of examination of 1000 Amalgam Restorations

87%—poor cavity preparation
62%—poor condensation of amalgam
89%—poor anatomic carving of restoration
48%—no cement base where indicated
90%—poorly finished

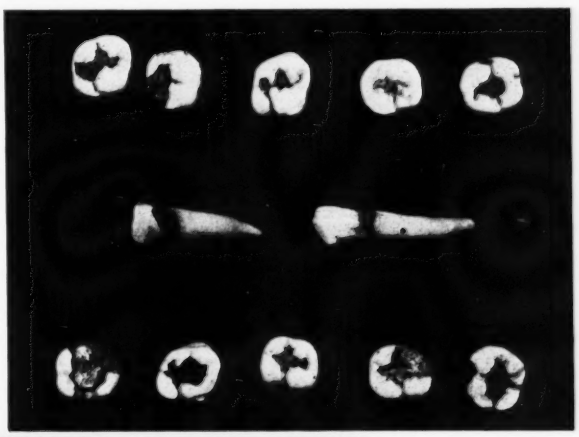


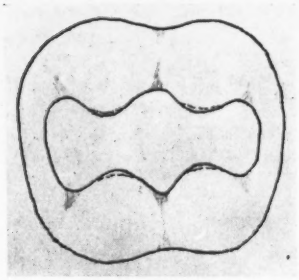
Fig. 1

Fig. 2

Fig. 1—Natural defects in grooves not eliminated in occlusal outline of cavity preparation, buccal outline and extension poor.

Fig. 2—Poor proximal occlusal type of cavity preparation.

Occlusal Cavity

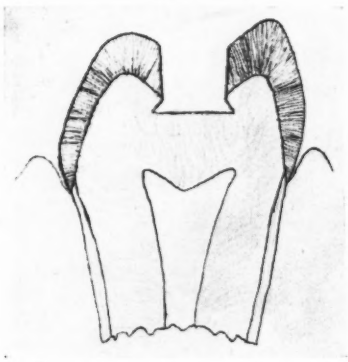


Occlusal View
Fig. 3

Occlusal Cavity

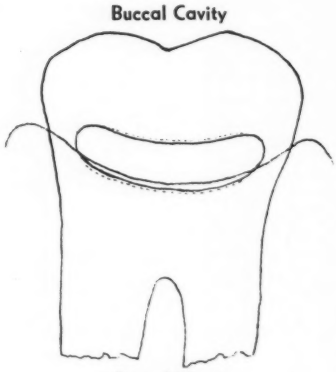
Mesio-Distal Section
Fig. 4.

Occlusal Cavity



Bucco-Lingual Section
Fig. 5

Buccal Cavity



Buccal View
Fig. 6

smooth, with sharp inner angles and polished enamel walls with small smooth taper stones. Fig. 5 illustrates the cross section made from buccal to lingual showing the buccal and lingual extension of the cavity in the region of the triangular ridges. The extension is approximately one-half the distance from the central pit to the crest of the cusps. The retention is only under the triangular ridges and made with a number 34 inverted cone bur which is sufficient.

Smooth Surface Cavities

Fig. 6, the illustration of the gingival third cavity, shows the extension of the surface outline of the preparation. The cavity preparation is carried mesially and distally almost to the mesial and distal line angles, occlusally to the beginning of the middle third of the crown or in a self-cleaning area, and to the gingival to an area just below the free margin of the gum tissue. The dotted line shows the area under the occlusal and gingival walls where the retention is placed with a number 34 inverted cone bur.

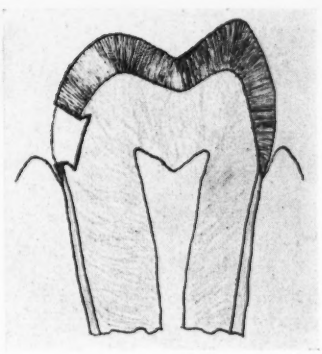
Fig. 7, a cross section from buccal to lingual, shows the gingival floor just below the free gum margin and the occlusal wall extended into a self-cleaning area. The depth of the cavity in the occlusal area has a greater depth than the gingival on account of the comparative thickness of enamel in the respective areas. Again, it will be noticed that the cavity walls are in the same direction as that of the enamel rods.

Fig. 8 represents a cross section through the gingival third of the tooth bringing out the shape and form of the pulpal walls and floor of the cavity. Its depth is uniform from mesial to distal following the same curvature as the outer surface of the tooth.

Proximal Occlusal Cavities

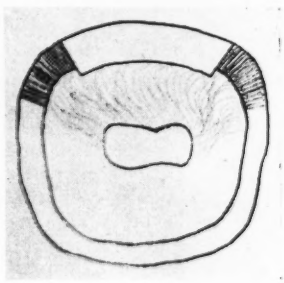
In proximal occlusal cavities the occlusal outline is the same as in the occlusal cavity (Fig. 3). The proximal extension as shown in Fig. 9 is brought buccally and lingually to a self-cleaning area. The occlusal retention is under the triangular ridges as shown by the dotted lines. The

Buccal Cavity



Bucco-Lingual Section
Fig. 7

Buccal Cavity



Cross Section of Gingival Third
Fig. 8

proximal pulpal wall has the same curvature as that of the outer surface of the tooth, a gradual convex surface.

Fig. 10 is a cross section from mesial to distal of the two-surface cavity. The occlusal portion has the same extension, depth and retention as in the occlusal cavity. The proximal step, however, is carried just below the free gum margin. A gingival lock is placed in the dentine at the gingival floor of the cavity with the suitable left and right gingival margin trimmers. Buccal and lingual gingival angle retention points are also placed in the dentine in the inner angles and extend one-third occlusally with the same instruments as shown by the dotted line in Fig. 11. The

Fig. 3—Occlusal view of correct occlusal cavity preparation.

Fig. 4—Mesio-distal cross section of cavity shown in Fig. 3.

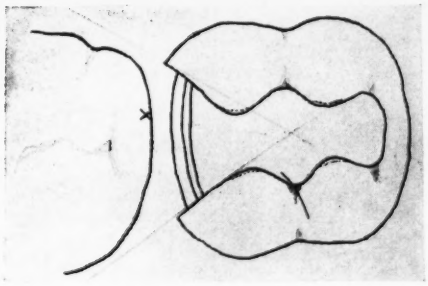
Fig. 5—Buccal-lingual cross section of same cavity shown in Fig. 3.

Fig. 6—Gingival third of tooth showing extension of surface outline of cavity.

Fig. 7—Gingival floor just below free gum margin and occlusal wall extended into a self-cleaning area. Cross section from buccal to lingual.

Fig. 8—Cross section through gingival third of tooth showing shape and form of pulpal walls and floor of cavity.

Two-Surface Cavity



Occlusal View

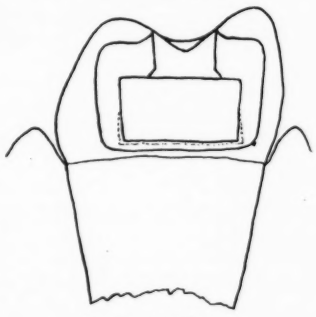
Fig. 9—Proximal occlusal cavity with proximal extension brought buccally and lingually to a self-cleaning area.

Two-Surface Cavity

Mesio-Distal Section

Fig. 10—Cross section from mesial to distal of the two-surface cavity.

Two-Surface Cavity



Proximal Surface

Fig. 11—Dotted line showing one-third occlusal extension of buccal and lingual gingival angle retention points placed in the dentine in the inner angles.

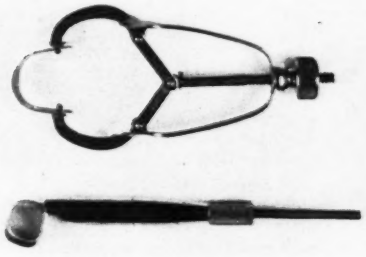


Fig. 12—Ivory matrix for two-surface cavities and the Wagner for three-surface cavities.

buccal and lingual gingival outer angles are rounded to permit better condensation of the amalgam at the outer margins. None of the cavo-surface angles is beveled; all inner angles of the cavity must be sharp and well defined and all enamel walls smoothly finished before the restorative material is placed.

The Matrix and Wedge

There are many different types and makes of matrix holders and bands which can be used in assisting the building up of the proximal amalgam. Of all these matrixes I have chosen two types that will be completely satisfactory in both two or more surface cavities. These are illustrated in Fig. 12, the Ivory matrix for two-surface cavities and the Wagner for three-surface cavities. In Fig. 13 a band has been selected for the two-surface cavity of the second molar. The matrix holder has been adjusted in the proper hole in the band just beyond the distal line angles of the tooth in order that in tightening the holder the band will be drawn close to the neck of the tooth. With the band now in place the height of the marginal ridge to be restored is marked on the band; at the same time the location of the contact point, which is usually in the buccal occlusal third in the bicuspid and molar regions, is marked with a cross. The marked band is then removed and the occlusal height of the band is cut down to the estimated height of the marginal ridge. At the place where the contact point was marked (Fig. 15) a small barrel-shaped stone is used to thin out the band at the contact; at the same time the band from gingival to occlusal is weakened with a small knife-edge stone, but one should be careful not to cut through the band. The prepared band is again placed back in position on the tooth and is ready for the placing of the wedge at the gingival.

In preparing a wedge for the gingival portion of the band, one should consider that all interproximal spaces are triangular in general shape with

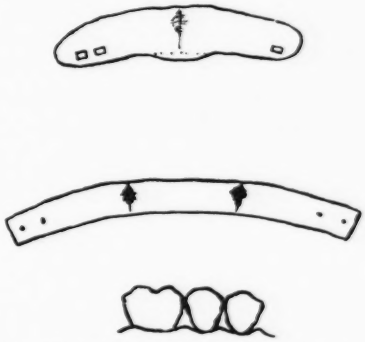


Fig. 13—Band selected for the two-surface cavity of the second molar.

the base at the gingival and the apex at the occlusal. The wedge is now cut in a triangular shape and the flat base is adjusted in width according to the space between the teeth as in Fig. 15. One should be sure that the wedge when in place does not interfere with the contact point or the contour of the matrix band. When properly prepared it is placed in position from the lingual because the lingual embrasure is the greatest, allowing better adaptation of the wedge at the gingival margin.

In the three-surface cavities the Wagner matrix is the most suitable as shown in Fig. 14. From a sheet of thin matrix material this curved band is cut to about twice the length of the circumference of the tooth, the same as the band for the two-piece gold crown, the greater length of the band being the occlusal and the shorter, the gingival. When placed in the holder and positioned on the tooth as in Fig. 14 the band is marked and prepared exactly as in the two-surface matrix. Wedges are also prepared and placed in a similar manner at both proximal surfaces.

Selection of the Alloy

The next important consideration is the selection of the alloy, and this must comply with the Federal Specification 356. The specifications for amalgam alloys provide a means of separating the better materials on the market from those of definitely

Fig. 14—Wagner matrix for three-surface cavities.

poor quality. It is not intended to provide a rating system and should not be used as such. The specification requires that alloys be uniform and free from foreign materials; that entire smooth amalgamation be attained in three minutes; susceptible to carving in fifteen minutes, and able to take and retain the polish after twenty-four hours. The chemical composition should be: silver from 65 to 70 per cent; tin from 26 to 29 per cent; copper from 3 to 6 per cent, and zinc not more than 2 per cent. Its dimensional changes should not exceed 4 microns shortening in twenty-four hours or 10 microns lengthening in the same time. The flow must not be more than 5 per cent in twenty-four hours under 3550 pounds per square inch starting three hours after packing. It should have a minimum crushing strength of 35,500 pounds per square inch after five days.

The Physical and Chemical Properties of the Alloy

Each material that enters into an alloy serves a definite purpose in establishing the character of the alloy. The characteristics that affect an amalgam alloy are expansion, contraction, strength, flow, ease of amalgamation, time of setting or hardening, and resistance to disintegration.

1. *Silver* is the expanding element which also confers strength, lessens the flow, hastens setting, and helps to make the amalgam white. When amalgamated alone it does not harden to any great extent.

2. *Tin* is the contracting element. Tin opposes the expansion of the silver with marked contraction. When amalgamated by itself tin does not set hard. As a part of the alloy it materially assists in amalgamation because it has the greatest affinity for mercury. It retards the setting time, contributes to the whiteness of the amalgam, and is the strongest factor in the retention of color.

3. *Copper* is the stabilizing element. Copper is the only material which in itself when amalgamated makes a material suitable for use in the mouth. It has the least affinity for mercury. Copper counteracts the strong affinity of the mercury for tin. It adds strength to amalgam, hastens the setting and lessens the flow. As it is subject to neither shrinkage nor expansion, it acts as a stabilizer of the amalgam.

4. *Zinc* is the toughener. Although the percentage of zinc in the amalgam is usually less than 2 per cent, it confers a certain degree of toughness or tenacity. It also aids in the development of whiteness of the amalgam and makes the amalgam slightly easier to manipulate.

The Manipulation of Amalgam

In the manipulation of amalgam definite proportions of the alloy and mercury should be used to attain a mix of amalgam with as little excess mercury as possible and still attain a plastic mass. Table 2 shows the results of a quantitative analysis of excess mercury constituting the product termed "push out" from the amalgamated mass, and it will be noted that tin only was recovered and ranged in quantity from 2.35 per cent of the original amount in the balanced alloy. This type of mix apparently destroys the balance of the alloy and the quantity of the expanding element is materially in an excess proportion, resulting in a marked expansion of the amalgam

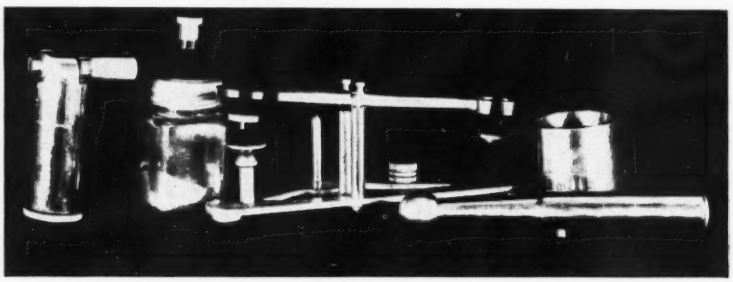


Fig. 16—Easiest and exact way of obtaining definite proportions of alloy to mercury.

restoration. The easiest and most exact way of obtaining definite proportions of alloy to mercury is seen in Fig. 16. Too small proportions should be avoided as it is difficult to obtain a thorough amalgamation, and the tendency is to over-amalgamate which reduces the crushing strength and causes the amalgam to shrink. As to the proper proportions, it is difficult to state any one proportion for every alloy as they all vary. This proportion must be worked out by test mixes

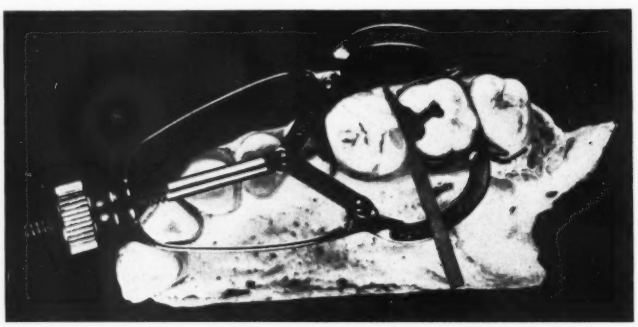


Fig. 15—Contact point of curved band.

TABLE 2

Quanitative Analysis of Excess Mercury

	Wt. of material used
Sample No.	40 Gm. HA
Group No. 1	20 Gm. alloy
Group No. 2	20 Gm. alloy
Group No. 3	20 Gm. alloy
Group No. 4	20 Gm. alloy
Wt. of pushout	**Percentage of metal lost**
8.7883	2.86% tin only
8.9350	2.99% tin only
10.4772	3.50% tin only
8.1380	2.35% tin only

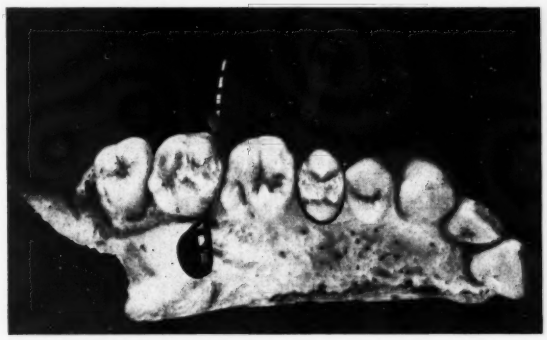
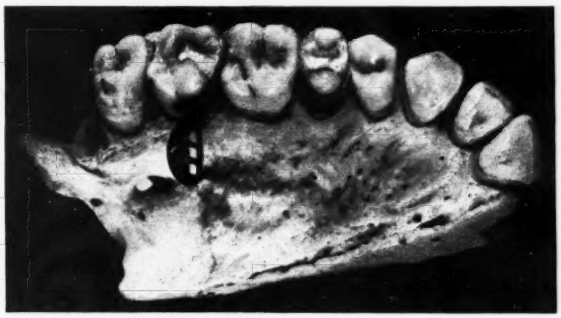


Fig. 17



Figs. 17 and 18—Wedge and matrix holder removed.

Fig. 19—Polished Restorations

for the alloy chosen by each operator. One operator may have to use the ratio of 6:8 while another may use a ratio of 8:11 for the type of alloy he has chosen to use. With proper proportions of a balanced alloy with mercury determined, the resulting amalgam will give a minimum contraction in the shortest time and minimum of expansion in the longest time.

In the mixing of the alloy in the mortar one should avoid prolonged mixing time. This has a tendency to destroy the crystalline form of the alloy, generates heat, and produces a greater initial contraction which can never be compensated for by the expansion. To clarify this statement, it is well to know that all amalgams on setting shrink during the first thirty minutes and then expand to their maximum in the following six hours. Prolonged mixing time also decreases the crushing strength and increases the flow. *Light mixing pressure is advocated, holding the pestle with a pen grasp and with just sufficient pressure to get an even combination of the alloy and mercury and to generate the least amount of heat. Heavy mixing pressure generates heat, causing the maximum amount of contraction which is never regained by expansion in the later setting period.*

Heavy pressure also produces a decrease in the crushing strength and increases the flow. Other factors that enter into the reduction of the crushing strength of the amalgam is the use of chemicals to accelerate the setting time, moisture, and the addition of free mercury after the mix has been made. Regarding the addition of free mercury to the amalgam, after the mix has been made, it reduces the crushing strength of the amalgam about 25 per cent with the addition of the first drop and approximately 17 per cent with the second addition. This factor also increases the flow. With the proper proportions, comparative light mixing pressure in the mortar and pestle from one to one and a half minutes and then mulling the mass in the palm of the hand approximately the same length of time will usually make the proper plastic mass ready for packing into the cavity.

Condensation of the Amalgam

In packing of the amalgam, small amounts of amalgam should be used at first and condensed in the lower portions of the cavity and retention points with the smallest suitable pluggers. One should be careful not to trap the excess mercury into angles and retention points. Small portions are successively added from time to time and condensed evenly until the cavity is almost filled. The packing pressure is approximately between 2½ and 4 pounds hand pressure. Excessive packing pressure causes the amalgam to shrink. Light packing pressure results in an expansion of the amalgam. Amalgam vibrated into a mold will expand as much as 18 per cent. When the cavity is almost filled the final amount of amalgam should be dry and free from every excess of mercury when condensed over the margins of the cavity in slight excess. In this step the dry amalgam absorbs the excess mercury which comes to the top from previous condensation. The cavity now overfilled with amalgam is allowed to set to a degree of hardness which on carving will produce shavings. The use of the carvers should be in a planing motion with the remaining tooth structure on the occlusal used as a guide to develop the normal tooth anatomy for that particular case.

When the occlusal is completely carved, the wedge and the matrix holder are removed as in Fig. 17. By moving the free ends of the bands on the buccal surface from mesial to distal it will soon break at the contact point where it has been previously weakened and easily removed as shown in Fig. 18. The lingual portion of the band is then removed from the lingual, and the proximal margins are carved if necessary. The bite is then checked and the amalgam allowed to set for twenty-four hours.

The amalgam should not be burnished following the carving as this produces a reamalgamation of the surface and removes the condensed particles or the alloy away from the margins only to be replaced with tin

and mercury which are slow-setting, contract, and have a tendency to become spheroid under temperature changes. After twenty-four hours have elapsed the filling should be polished as in Fig. 19. Fine sandpaper discs and strips are used on the proximal surface; small stones and sulci discs and strips are used on the occlusal. The finer polishing is done with moist pumice paste followed by whiting or any of the fine polishing powders with BS polishers and orangewood points. One should be sure that there is no amalgam overlying the enamel edges of the cavity, either occlusal or proximal. If such care is exercised in the placing of amalgam restorations many failures will be avoided and better service rendered to the patient.

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REMOVAL OF ROOT APEXES

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Operations on the oral tissues should be completed in as short a time as is consistent with good work, undue laceration and traumatization of surrounding tissues being avoided. Prolonged operating and the rough handling of tissues produce strain and shock to the patient. The haphazard cutting of tissues and chiseling of bone is unwarranted and results in a mutilation which makes it difficult for both the patient and the prosthodontist whose work follows that of the exodontist or oral surgeon.

Any technique that will reduce the operating time or lessen the amount of surgical intervention and at the same time give good results should be given consideration.

One of the most common conditions in which tissues are traumatized occurs in the removal of teeth when the root fractures leaving behind a small portion of the apex. When this occurs, the operator should not indiscriminately dig around in the hope that the apex will come out, but he should follow some surgical procedure which past experience has proved to be adequate for the condition at hand.

In many cases in which a small apex was retained, I have seen the conventional flap made and the buccal process chiseled until the root tip was reached and then elevated. Removal of the entire buccal plate in the region of the root tip is in many cases unwarranted and results in a disfigurement of the contour of the ridge and makes it more difficult to fit a prosthetic appliance.

To save the labial process in the anterior regions in removing root tips, I have used the technique shown in the accompanying illustrations with excellent results. The same principle may be applied to the removal of roots other than those of the anterior region as the condition for its application presents itself.

In cases in which a discharging sinus has been present and one is desirous of inserting an iodoform drain, it can be easily inserted by way of the socket. The removal of the sutures in forty-eight hours and the daily application of 25 per cent argyrol should be all that is necessary to constitute the postoperative treatment.

30 South Broadway.

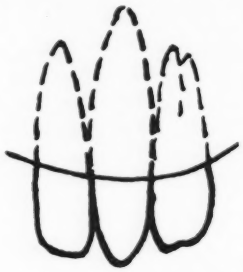

Fig. 1—Cuspid to be removed in position.

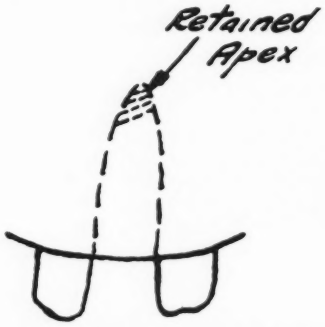

Fig. 2—Socket after removal of tooth with small portion of root tip retained.

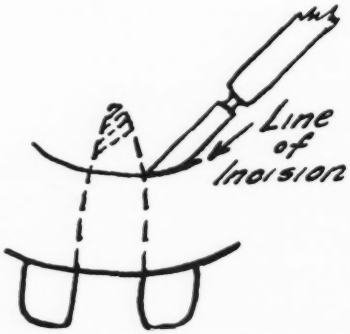

Fig. 3—An incision is made semilunar in shape with the convexity toward the incisal plane. The incision is of the same type as that used in an apicoectomy.

Fig. 4—The tissue is elevated with a periosteal elevator and held in position with a tissue retractor, the bone covering the region of the root tip being exposed. With a gouge and mallet, a window is made in the region of the root tip, the apex uncovered and removed. It is needless to say that care should be exercised to avoid injury to the adjacent teeth. The edges of the window are smoothed with a bone curet. In many cases in which a large granuloma exists at the apex, it is conveniently removed through the window at this stage.

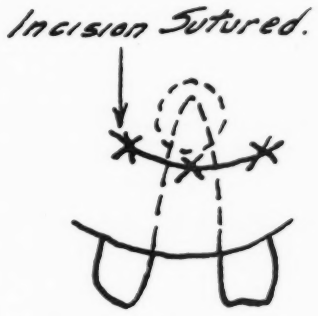

Fig. 5—Flap sutured back in its original position.

FACIAL BONE INJURIES

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and
FLOYD E. STRAITH, D.D.S.
Detroit

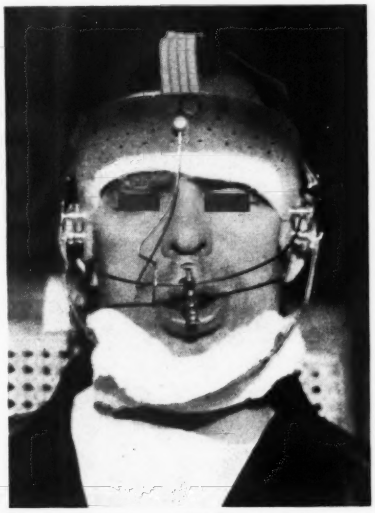

Fig. 1—Patient sustained typical "steering post injury." Bilateral fractures in lower cuspid regions with posterior displacement of symphysis. Bilateral fracture of necks of both condyles with posterior displacement of entire jaw and downward displacement of large fragment from left side. Lower lip and chin severed from attachment to symphysis region. Cap splint with arch bar cemented to lower molars. Cap splint on lower anterior teeth locked in proper position to arch bar. Entire jaw brought forward by elastic traction from splint to an adjustable attachment on external arch bar. Chin pad, on swivel in temporal region, forced upward and forward by elastic traction to correct position of depressed fragment. Height of arch bar controlled by wire to forehead. (Appliance after Kazanjian.)

As a result of the increased speed of automobile travel, in case of accident the impact often causes the driver's face to be forced against the steering post with terrific force, and, depending on the position of the face at the moment of impact, a great variety of serious facial wounds are produced. These injuries are so typical that we have designated them as "steering post injuries." The passenger in the front seat is often thrown against the cowl or windshield with a similar and often more serious injury resulting. If the chin strikes the steering post, there is often a fracture of one or both necks of the condyles, which are usually treated by simple mandibular wiring. In our practice we do not resort to any open operation for direct manipulation of the condyle in case of its displacement. We believe open reduction encourages operative and postoperative complications, such as intracapsular infection and ankylosis. In our experience the conservative treatment of even marked displacements of the condyle heads seems justified and is substantiated by the recommendation of Ivy, Kazanjian and others. Limited function occasionally results but we have not had such a case result in ankylosis.

In many instances the blow may be so severe as to break one or both sides of the mandible and the ingenuity of the operator is taxed to design splints and methods of controlling the various fragments (Fig. 1). In edentulous cases usual treatment is by a vulcanite splint with circum-mandibular wiring (Fig. 2) as advocated by Ivy and Black.

Should the steering post strike the mouth and upper jaw, there is often a loss of several teeth and in many cases a complete transverse fracture of the upper jaw results. The jaw is forced backward and usually dropped down, and may appear to be hanging by the mucous membrane. In many cases the upper jaw is also fractured through the center and the treatment is necessarily more complicated.

In the case of a simple transverse fracture of the maxilla, a full upper impression is taken, but where there is also a midline fracture, the impressions of each side are taken, poured in plaster, and the models of the separate upper fragments are articulated with a model of the lower teeth; a cast silver splint is then made as in Fig. 3. Oval tubes are soldered to the splint and side arms adjusted

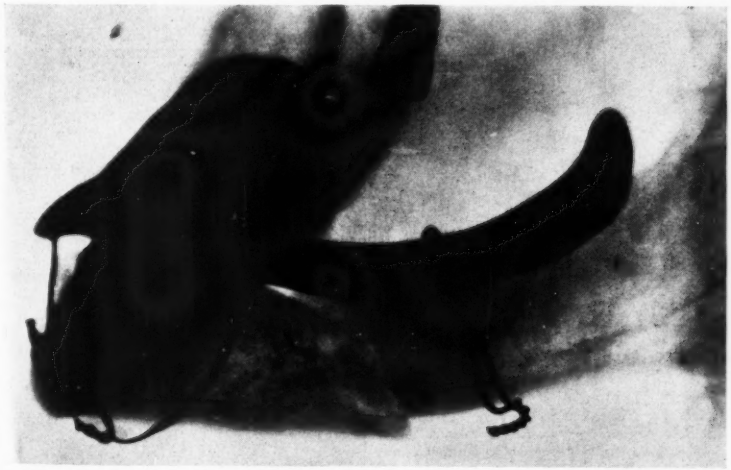

Fig. 2—Circum-mandibular wiring over vulcanite splint. Small incisions along inferior border externally, and buccally and lingually intra-orally. Antrum trochar and cannula passed from below upward. Silver wire (20-gauge) passed through cannula from mouth. Cannula and trochar then inserted through oral opening downward and wire usually twisted over splint in mouth.

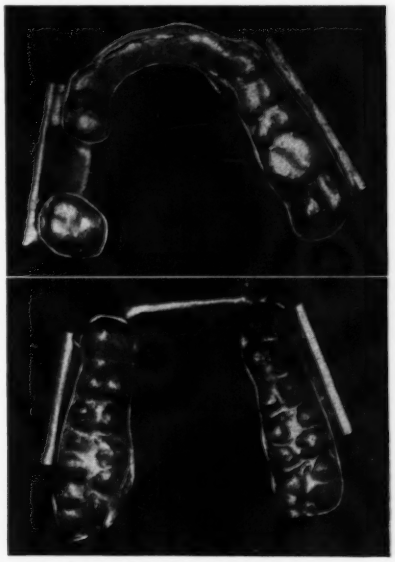

Fig. 3—Cast silver splints from modeling compound impressions, showing oval tubes for arch bars which prevent rotation. Impressions should be reinserted in mouth or trimmed so that splint slips over teeth easily. Cusps of splint may be ground through to allow for more accurate articulation. Mandibular splints usually cemented to teeth. Not ordinarily necessary to cement upper splints.

Fig. 4A

Figs. 4A and 4B—Head harness from trunk strap material. Method is satisfactory where fractured surfaces of maxillae do not tend to shift when once reduced. Security of attachment and method of fixation not positive enough where there is marked displacement or comminution or fragments are difficult to retain in proper apposition.

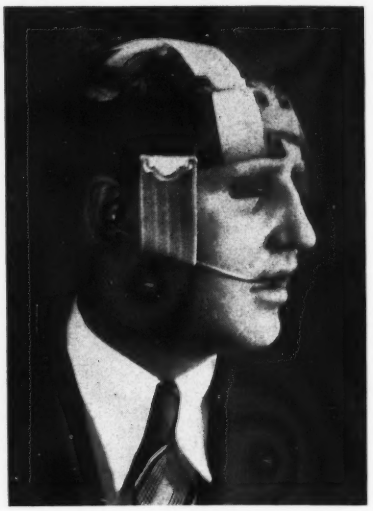

Fig. 4B

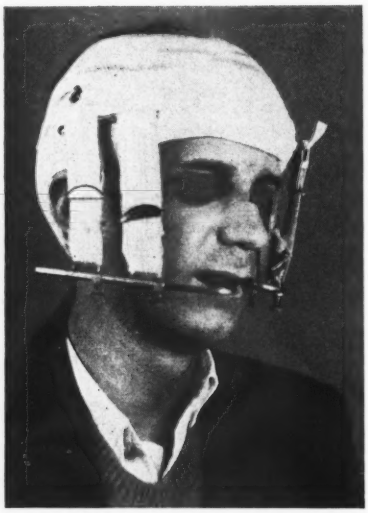

Fig. 5—Plaster bandage head cap provides nearly immovable anchorage. Elastic traction from splint arms to head cap is often satisfactory retention but being flexible it is not positive in its fixation or control.

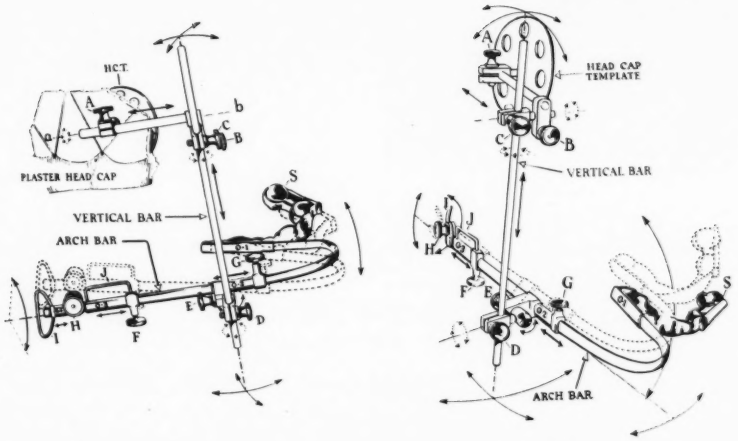

Fig. 6—Illustrating the mechanics of authors' appliance which allows positive fixation of any fragment in any plane and positively controlled elastic traction for gradual reduction or shifting of fragments. Elastic traction can only function in plane determined by angle of arch bar or vertical rods.

Fig. 7

Figs. 7A and 7B—A, Front view. B, Three-quarter view. Apparatus in use in badly comminuted fracture of maxillae where elastic traction would result in over-correction. There were also multiple fractures of mandible treated with cast splints.

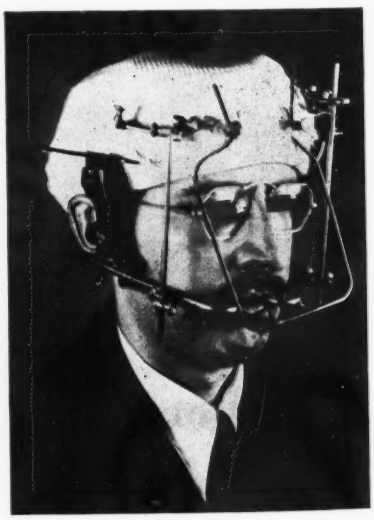

Fig. 7B

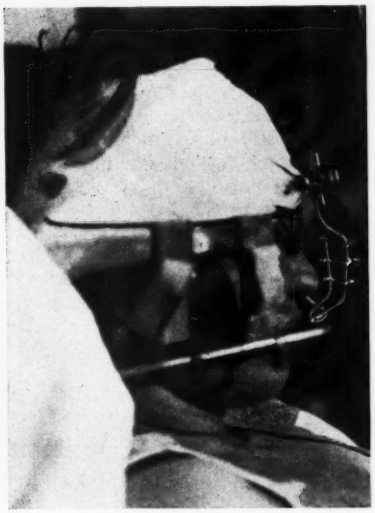

Fig. 8—In crushing nasal injuries an attempt should be made to raise the depressed nasal bridge. From two binding posts in forehead region two stiff wires may be brought down in "Y" formation and terminate in lateral horizontal bends below the tip of the nose. This serves as a fulcrum for U-shaped nasal splint. Elastic traction from outer arm of splint to wire support produces outward and upward traction within the nose.

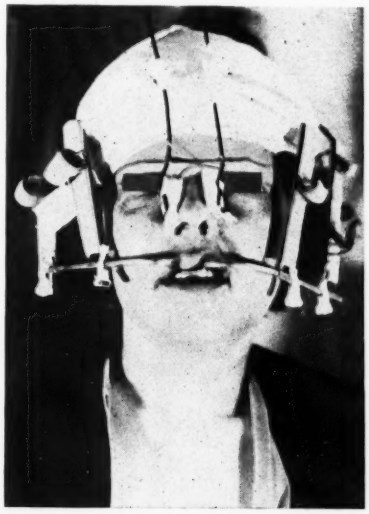

Fig. 9—To correct lateral deviations of the nose, pressure can be applied by elastic traction between two wires holding pressure pads and anchored to forehead binding posts.

Fig. 10—Technique for elevating depressed malar bone fractures through small intra-oral incision through mucous membrane behind the maxillary attachment of the malar bone. Upward and outward pressure with an antrum trochar introduced at this point combined with external manipulation of the malar bone will correct the displacement in nearly all such fractures.

Fig. 11A—In anterior-posterior roentgenograms of the normal skull there is an angle of approximately 30° (A, B, C) formed in the outer wall of the orbit. (After Shea.) In depressed malar bone fractures this angle is reduced or obliterated as illustrated.

Fig. 11B—When the malar bone does not stay in position after reduction it can be anchored to the skull by wiring to the pyramidal process of the frontal bone, thus restoring the normal angle.

Fig. 10

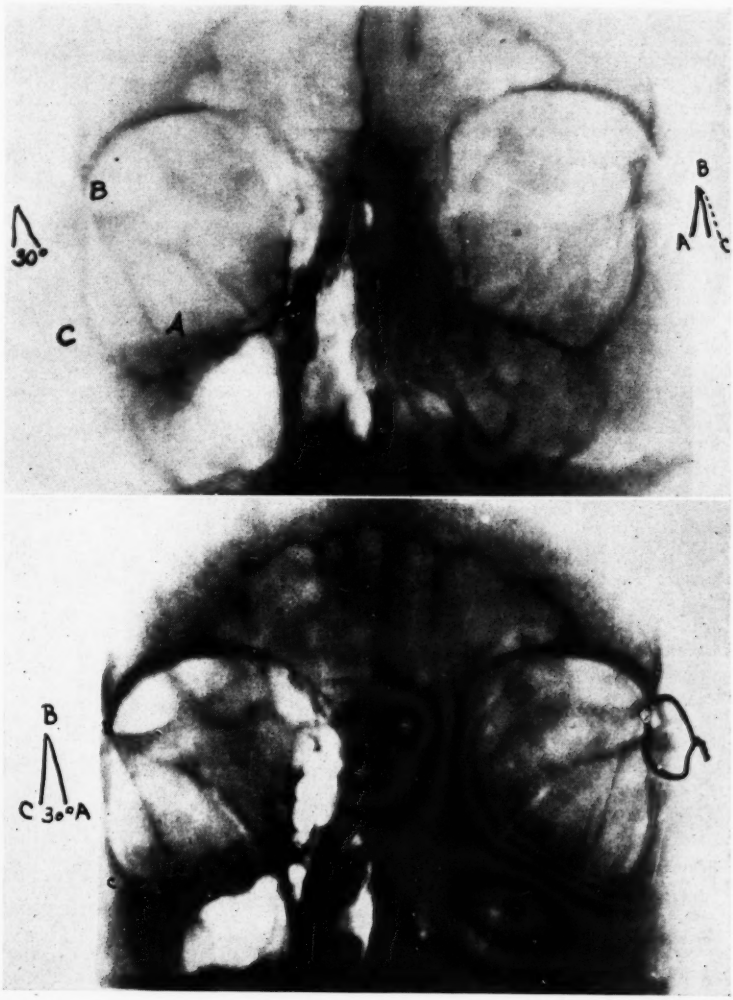

Fig. 11A (top)
Fig. 11B (bottom)

Fig. 12—If a fracture of the maxillae has not been recognized, a retroposition of the maxillae often results with accompanying malocclusion. If consolidation is not too far advanced, elastic traction to arch bars with the directional pull controlled will often correct this malocclusion by advancing the maxillae to proper position. The method is also applicable after treatment by splints or wiring to perfect the occlusion. Shows principle of forward and slightly downward direction of pull to overcome posterior displacement and slight open relation in anterior.

by elastic traction to the head cast.

The method of traction in simple cases is to make use of elastic straps (suspender straps with adjustable fasteners) from the splint side arm to the head cap. In simple cases a head cap made of trunk strapping (padded slightly) will answer the purpose (Figs. 4 A and 4 B). In others, a plaster head cap with side arms of coat hanger wire is constructed and the traction made upon these (Fig. 5). Care must be exercised in making tension on the elastic bands so that over-correction and an open bite will not result. The straps should be adjusted so that the pressure just holds the fractured surfaces of the maxilla up in close contact with the base and permits the lower teeth to articulate properly with the upper splint.

In severe crushing fractures of the maxilla elastic traction will sometimes over-correct the position; therefore, the maxilla must be literally suspended in its proper relationship to secure a correct union of the fragments. To do this, we have devised the apparatus illustrated in Fig. 6. This apparatus permits movement in three planes at the upper and lower ends of a solid brass rod which holds the splint and upper jaw suspended in a fixed position in proper relationship to the head cap and mandible (Fig. 7).

In case of crushing nasal injuries, attachments can be placed in the plaster head cap to which the apparatus can be attached to elevate the nasal bones (Fig. 8), or cause lateral pressure to keep fragments in proper alinement (Fig. 9).

In cases of complete transverse fractures of the maxillae, particularly those of a crushing type, the mandible should not be utilized by wiring or with an elastic bandage to hold the maxillae in position. The movement and pressure of the mandible in closing causes an alternate compression and opening of the fracture lines with resultant delayed healing. Where the fracture involves only one maxilla, one of three methods may be used as indicated: (1) A cast splint may be cemented to all the upper teeth, those on the solid side being utilized to stabilize the fractured maxillae; (2) arch bar wiring may be used, or (3) the mandibular teeth may be wired in occlusion to those on the fixed fragment of the maxillae.

Steering post injuries frequently result in a crushed malar bone which, if left uncorrected, results in a flattened appearance to that side of the face. In spite of the swelling, such fractures can usually be detected by feeling carefully around the rim of the orbit and noting any irregularities which usually occur through the

Fig. 13A—Typical crushing injury sustained by guest passengers. The fractured maxillae were readily corrected. The nasal bones refused to stay up and deformity resulted.

Fig. 13B—At operation the diagonal scar was excised; the bony prominence above the scar removed through this incision and a rib cartilage transplant introduced to fill in the depressed nasal bridge. The photograph was taken three weeks after operation.

Fig. 14A—Typical scar often resulting after multiple fractures of mandible where infection and draining sinuses follow.

Fig. 14B—Such scars can be excised, fat flaps interposed between skin and bone, and the appearance much improved by careful subcuticular suturing.

infra-orbital foramen, or at the zygomatic or frontal attachments.

Several methods of treatment have been advocated:

1. Grasping the malar bone by a strong towel clip or tenaculum through the skin of the lower lid and cheek and applying traction will suffice in many cases and is a method often employed.

2. Some operators pass an antrum trochar through beneath the inferior turbinate and elevate the bone from within the antrum.

3. Other operators enter the antrum through the canine fossa, elevate the bone, and pack the antrum.

4. The simplest and most generally satisfactory method in our hands has been the introduction of an antrum trochar, or other curved instrument, through the upper gingival fold and close behind the maxillary attachment of the malar bone. Upward and forward pressure on the malar bone from this position will raise the majority of depressed fractures (Fig. 10). In obstinate cases this technique may be combined with traction as first suggested, but this is seldom necessary. If the bone does not remain in place, we resort to the method of Sill: wire the malar bone to the frontal attachment (Figs. 11 A and 11 B).

There are often sequelae after such injuries which should have treatment. Fractures of the maxilla may be overlooked and the patients complain of the fact that the teeth do not occlude properly. On examination, the maxilla may be found to be healed in a posterior position. If too much time has not elapsed, the maxilla can be brought forward bodily by elastic traction from a posterior position on a maxillary arch bar to an anterior position on the mandible. Spurs are soldered to the arch bar or hooks formed by interdental wires. Elastics must be placed so that traction exerts maximum pull solely in the direction movement is desired. Too much downward traction will tend to open the fracture line (Fig. 12).

Badly crushed noses are often complicated with a septal abscess or loss of bone, resulting in a saddle nose. Such deformities can be corrected subsequently by means of a rib or ear cartilage transplant (Figs. 13 A and 13 B). Resulting scars often cause patients considerable embarrassment and should subsequently be excised and carefully resutured with subcuticular stitches (Figs. 14 A and 14 B).

Conclusion

The growing number of accidents resulting in steering post injuries renders this problem increasingly important. The more severe injuries of this type are more frequent in young girls and women who as guests in a speeding car are suddenly thrown against the cowl of the car resulting in a broad crushing injury to the structures of the face. For this reason it is extremely important that more attention be given the care of such injuries in order that disfigurements may be minimized.

1713 David Whitney Building.

DENTAL ROENTGENOGRAPHY

Newman D. Winkler, D.D.S., of New York, points out that the basic fundamentals of dental roentgenography are often overlooked. The proficiency of the operator, of course, is a vital factor in the technique. This technique is primarily a simple one, yet mistakes creep in which destroy the ultimate perfection. Since it is granted that all dentists know the fundamental principles underlying good roentgenographic procedure, Doctor Winkler calls attention to the errors rather than the methods and the frequently repeated fundamentals.

Common Errors

1. *A Blurred Image*—This is usually due to (a) motion in the machine itself and the tube; (b) motion of the patient or the film.

The patient should be instructed to sit perfectly still until told to move again. The operator should wait a second or two until the tube and tube arm are at complete rest. He should make sure that the patient assumes a comfortable position in holding the film in place.

2. *A Light Field or Background*—This is due to (a) underexposure; (b) insufficient development; (c) using developing solution too long.

For radia-tized film an average of three seconds is allowed for exposure. Exposure charts should be consulted. The exposure time *must* vary depending on the density of structures to be taken. For thin people the exposure time is reduced. For obese persons the exposure time is increased. For children, exposure time is reduced. Development of the film *must* be done with thermometer and clock.

3. *Black Field or Background*—This is due to overexposure or overdevelopment.

4. *Granulation of Emulsion*—The mottled appearance is due to difference in temperature between developing and fixing solutions; therefore it is necessary to use only a tank having a circulating water compartment around the developing and fixing tanks.

5. *Yellow-Tinted Field or Background*—A yellow-tinted field or background means that the film has been exposed to light.

If the film packet is allowed to remain in the mouth too long it becomes water-soaked and allows the outside protective paper to unravel, thus exposing the film within to the light. A dark room must be absolutely light-tight.

General Precautions

The tube shield should be taken apart occasionally and cleaned thoroughly. The Coolidge tube is reinserted in the sighted position.

The milliampere readings should be checked to register 10 milliamperes at 110 volts.

A freshly dated film should be used.

An x-ray chair with a headrest that keeps the head in a fixed position should be used.

The developing solutions should be changed with reasonable frequency.

2488 Grand Concourse.

COMPLETE FULL DENTURE TECHNIQUE

VII. SET-UP: FLASKING: MILLING

C. J. STANSBERY, D. D. S.
Los Angeles

WITH the teeth, which have been tried for esthetics, in place on the casts on the Tripod, and the Tripod adjusted from the check bites, the next procedure is the arrangement of the teeth in their various occlusions. If the closure in the step of lower impression taking was in true centric, which probably it was not, and was so maintained in any opening or closing at the try-in stage, then the teeth will now exhibit centric occlusion on the Tripod. However, more than likely the previous closure was in a rest position with a variable amount of protrusion along with right or left deviation. In such a case the teeth should be shifted horizontally again to exhibit centric relation. Also at this time, if these changes are sufficient to change markedly the esthetic arrangement, it might be advisable to call in the patient and check on the changes made. Rarely, however, will changes be made to justify this visit from the patient (Fig. 73).

A review of the technique to this point will show that this is the first opportunity afforded to place the teeth in occlusion with the positions of the casts determined by the centric check bite. The teeth were originally set from the relation registered during lower impression taking, then perhaps varied in the try-in, but neither of these relations had the necessary placement derived from the apex of the Gothic arch; neither had they the equalization of ridge bearing as secured by the central bearing point in the check bite.

The Tripod at this time shows the accurate vertical height determined at the try-in and so held by the graduated thumb nut on the extension of the upper plate of the Tripod. Looking forward to the milling, which must of necessity close the vertical height in amount equal to the porcelain ground away in the formation of facets, the graduated nut is now turned down one-half turn, which raises the suspended plate and increases the vertical distance between the casts. This allows the milling to begin at this increased vertical height and grinding into correct vertical height, rather than to begin at the correct vertical height and allow the grinding to close the case unduly.

To overcome the looseness of the waxed-up teeth, owing to this opening, a sheet of warmed 30 gauge casting wax is laid over each cast. The base plates are now reseated and securely sealed to the casts. This has the effect of raising all teeth approximately 1/100 of an inch above the level they will be at the finish of the milling in centric occlusion, thus providing porcelain stock for the formation of facets.

The problem of setting up or arranging the teeth for balance is no different from that on any other instrument. However, as the milling device of the Tripod assures the complete elimination of interference in the occlusions, it is only necessary to place the teeth for contacts at the limits of these excursions. While one may use any desired method or routine of setting up the teeth, the following will be found to be helpful hints in tooth arrangement:

The Tripod is adjusted for protrusion and the anteriors set sufficiently long so that in protrusion the lowers will overlap and lock outside the uppers. Utilizing this locked position to hold the casts in protrusion, the second molars are inclined or tilted to maintain a balance in this position. One should not endeavor to carry the curve started by the inclination of the second molar forward over the first molar and bicuspids, but leave these teeth in a nearly horizontal plane (Fig. 74). The upper member of the Tripod is raised to clear the incisors, reseated in centric and in this position the occlusion of the second molars is checked. One should not endeavor to arrange for sliding contact at this

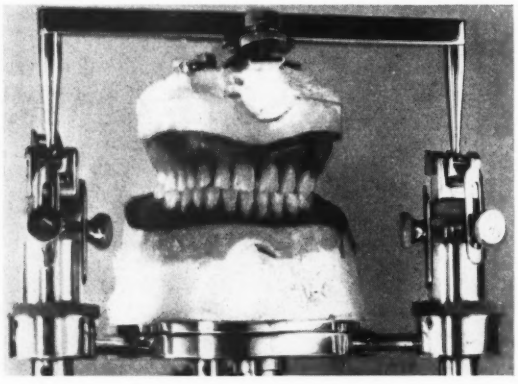

Fig. 73—The teeth in centric occlusion mounted on the Tripod. Changes have been made in the try-in to conform to the true centric relation of the mounted casts.

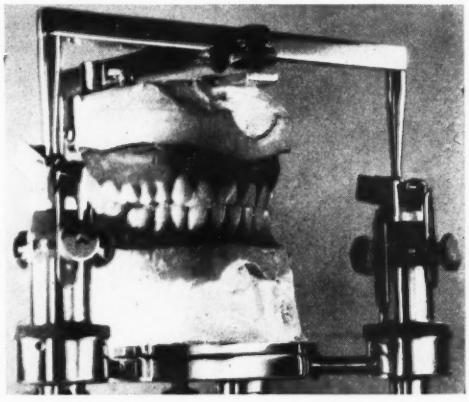

Fig. 74—Points for observation in this illustration are: (1) the protrusive positions of the guide blocks; (2) the overlapping position of the lower incisors; (3) the locked protrusive effect which this overlapping gives; (4) the food space between the cuspids, bicuspids and first molars; (5) the balancing contact of the second molars.

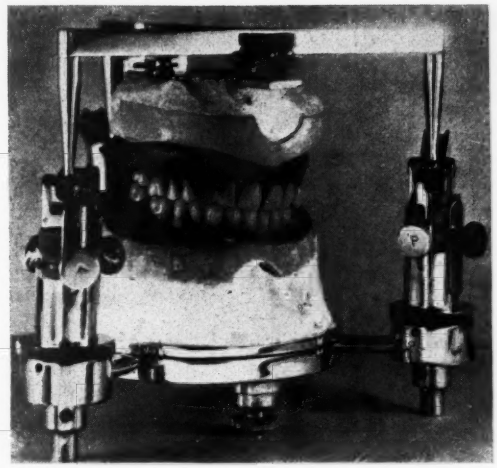

Fig. 75—The Tripod, having been adjusted to right excursion, and the right upper cuspid removed, the bicuspids and first molars are shown arranged for working relation. Notice the lack of contact of the second molars.

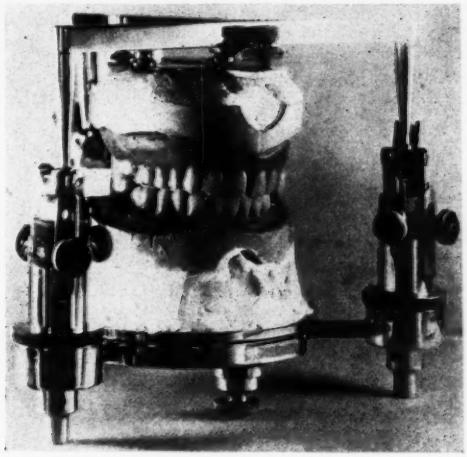

Fig. 76—The right excursion, as shown in Fig. 75, is in this illustration increased until the molars and bicuspids are well out of contact to provide food compression space. In this position the upper cuspid is reset for contact, the second molars of the opposite side are likewise in balancing contact.

time but leave this for the milling operation. Neither is it necessary nor desirable that other than the incisors and second molars function throughout the protrusive range. This arrangement allows for considerable compression of a bolus of food between the bicuspids and first molars before they contact, while the condition of balance is maintained by the incisors and second molars. The imitation of wear or aging of the anterior teeth depends on the amount of locking in the protrusive set-up. The milling of one denture against the other results in a better imitation of Nature's process than can possibly be attained by the use of the stone.

Next the lateral excursions are given attention. For an example, the right excursion will be discussed. The guide blocks and turrets are adjusted in their "R" positions and, for convenience, the upper right cuspid is removed. The bicuspids and first molars are arranged to exhibit the working relation by varying their lateral inclinations. It is best that this relation should not be extended to include the second molars; especially is this true over lower ridges that show a decided upward curvature in this region. Doctor Victor Sears calls attention in his textbook *Full Denture Procedure* to this tooth arrangement. On page 52 of this book Doctor Sears points out that the horizontal area of the mandibular ridge under the bicuspids and first molars is best suited to withstand the directions of the masticating forces, while distal to this area the ridge usually slopes upward and pressures delivered over this area have the tendency to skid the lower denture forward on the ridge (Fig. 75).

The right excursion is now increased until biscuspids and molars are well out of contact, at least 1.5 mm., and while the casts are so held the cuspid is replaced with its incisal point in contact with the lower first bicuspid and cuspid. Also, while so held, the second molars of the opposite or balancing side are examined to see that contact is maintained. If not, the contact is restored by tipping them laterally, but the sagittal inclination must not be varied, as in so doing their relation in the protrusive balance already obtained would be altered (Fig. 76).

The arrangement for the left excursion is treated similarly, following the directions given and using Left for Right. This arrangement allows a bolus compression range between the bicuspids and first molars while the dentures are being stabilized or balanced by the contact of the cuspids and the opposite second molars before the working side is in actual contact. It should be noticed that in this arrangement the so-called 3-point contact has been reduced to a 2-point in the lateral excursions. Two points diametrically across a denture are all that are necessary to maintain stability, and for the third point the bolus of food has been substituted in the initial masticating act.

To those who read these lines and still imagine a bolus of food as similar to a walnut in size and resistance it must be admitted that it is true, as Doctor J. M. Prime says in his much quoted expression, "Enter bolus, exit balance." But to those who reason that one should use artificial dentures successively to attack and compress food and with each succeeding bite have the teeth more nearly approach each other until the outreaching cusps of the balancing cuspid and molar contact, the fallacy of the statement becomes apparent. Under these conditions the balance of the denture is established while a considerable thickness of food is still present between the bicuspids and molars. The tactile sense of the ridges will control the dislodging forces on the dentures by keeping these forces within the limits that otherwise might dislodge the dentures. From the instant of first contact of the balancing teeth all the power of which the dentures are capable may be exerted in further compression and trituration of the food bolus.

The casts are now removed from the plaster attachments to the Tripod, the plaster being left in place, and prepared for vulcanization. The flasking, packing, and above all the complete closure of the flask, are important in this technique.

1. In flasking, either the lower half of the flask is lined with cellophane or a strip of warmed base plate is laid around the inside of the flask to within one-fourth inch of the edge of the flask to assure the easy removal of the plaster without digging or prying which might injure the cast.

2. Wet cellophane is adapted over the base of the cast and the sides as far up as the valve seat. This is done to protect the base and index grooves from the investing plaster and to ensure the accurate replacement of the casts on the Tripod. The preserva-

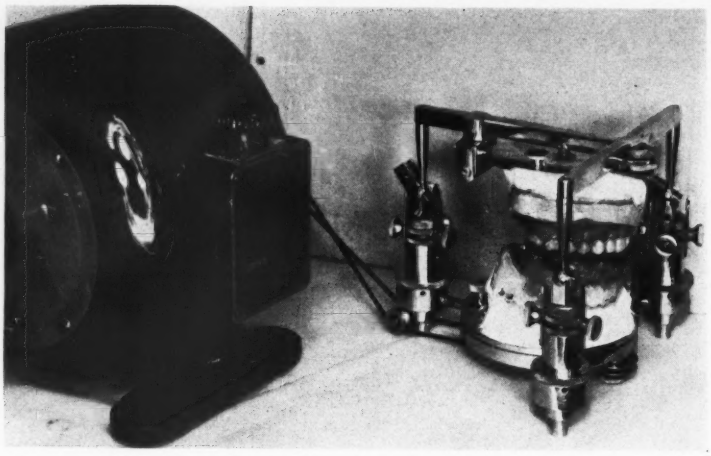

Fig. 77—Notice the belt connection to the lathe, the replacement of the centric sleeve by the eccentric pulley, the reseated casts, the abrasive paste, and the protruding screw through the graduated nut. This protrusion shows the amount the upper cast has been raised preparatory to milling.

tion of these casts intact, with the finished dentures undisturbed, is important and necessary to the milling operation.

3. One should not over-pack as the *flask must be perfectly closed.* Any lack of closure will have the result of elongating the teeth just as much as the flask lacks closure, which in turn will necessitate excessive milling and a resultant overgrind of the cusps.

After vulcanization and removal from the flask the casts and dentures are accurately replaced on the Tripod and thoroughly sealed with hot sticky wax around the entire periphery. The upper suspended plate is further raised by the use of the graduated nut until the excursions clear all interfering cusps. All occlusal surfaces of the teeth are thoroughly covered with abrasive paste. The centric collar is removed from the base of the Tripod and replaced with the eccentric pulley. The Tripod is attached to the laboratory lathe using a short engine belt (number 202).

604 Medico-Dental Building.

The belt runs from the lathe pulley under the idler pulleys and forward to engage the eccentric pulley Fig. 77. The lathe is run at low speed and the upper member of the Tripod is kept in constant movement along the guide blocks to allow the milling to form the correct facet inclinations. As the milling proceeds with each elimination of cusp interference, the upper cast is lowered by one-quarter turns of the graduate nut and at each lowering all three excursions are milled.

When the lowering has been accomplished to within one-half turn of the position that the graduated nut held for correct vertical height, the abrasive paste is removed from the upper denture only and the facets examined. If at this stage all facets are formed it is better to stop milling rather than to arrive at correct vertical height at the expense of overground inefficient cusps. The one-half turn forfeited to preserve efficient cusps amounts to opening the bite one fiftieth of an inch, an amount not discernible as a variance from the accepted esthetic set-up. Of course the most desirable finish is to arrive at the exact vertical height and have all facets of minimum area. This would mean perfect flask closure and a cancellation among themselves of all conditions such as wax or plaster expansion or contraction, displacement of teeth from vulcanizing changes, or any other cause.

The Tripod is so made and is of such dimensions that the jig mounted casts are in the same relation to the axis of the hinge of the upper suspended plate as though mounted to the average opening axis of the mandible as determined by Doctor Gysi.

When the milling is complete the centric sleeve is replaced, the casts removed, and the dentures finished in the usual way.

(End of Seventh Installment)

AUTHOR'S NOTE

It is pleasing to the author that this series has been of interest to those who are seriously trying to improve their denture service even to the extent of breaking away from some of the stereotyped procedures that have been deemed imperative to denture excellence. This interest has been shown by the many readers of The Dental Digest who have even now written comments and questions on the series.

If the reason underlying any step of the entire procedure has not been made clear, if any technical step is obscure, or if any difficulty has been encountered in the practical application of this technique, will be glad to answer questions personally, and for the benefit of other readers incorporate these answers in the concluding installment of this series. This final installment will appear in the December issue.

LETTERS TO THE EDITOR

"Permit me to compliment you on the excellent colored illustrations of Dr. Price's paper and the 'Education of the Dental Patient' series. The latter are extremely valuable when clipped in a loose-leaf binder. Keep it up."—C. FRANK TUMA, D.D.S., *Cleveland, Ohio.*

"Permit me to congratulate you for your fine work in the dental journal field. The section 'The Education of the Dental Patient' alone, is well worth the price of admission."—R. E. ALTERS, D.D.S., *Dallas, Texas.*

"Being connected with the editorial department of the 'Indian Dental Journal,' I have opportunity to see almost all the current dental magazines of the world—which are issued in English, but I can tell you honestly that I like your magazine immensely and find it one of the most interesting publications on the subject. I congratulate you from this end of the world for its beautiful 'get up' and its absorbing articles."—DR. S. K. GUPTA, *Calcutta, India.*

"Sorry I dropped you a line last night asking for March issue. It came this morning and is well worth waiting for."—A. O. WRIGHT, D.D.S., 268 *Grand Ave., Oakland, Calif.*

"I have been receiving dental publications for the last six years and I have never been so impressed by any of them so much as I have by the new publication, DENTAL DIGEST.

"I can, in a shorter period of time, receive more benefit from your illustrations and articles than I can from others that are long and drawn-out.

"May I compliment you upon your efforts, and express my hope that you will continue with the same type of illustrated and educational articles."—T. A. PETZOLD, D.D.S., 5802 *Second Avenue, Los Angeles, Calif.*

The Editor's Page

WITHOUT editorial comment we are publishing herewith an outline abstract compiled from "Rules and Regulations Governing Medical Care Provided in the Home to Recipients of Unemployment Relief" as released by the Federal Emergency Relief Administration. Only such parts of these regulations as are of interest to members of the dental profession are included in this abstract. For more detailed information interested persons or professional organizations should write to the Federal Emergency Relief Administration, Washington, D. C.

1. *Policy*—An agreement between the relief administration and the *organized* medical, nursing, and dental professions, state and/or local.

A. Recognizes in their legal and economic limitations the traditional dentist-patient relationship in the authorization of emergency dental care.

B. Agreement by the dentist to furnish the same type of service to an indigent person as would be rendered to a private patient, but such authorized service shall be a minimum consistent with good professional judgment and shall be charged for at an agreed rate which makes due allowance for the conservation of relief funds. The common aim should be the provision of good medical service at a low cost to the mutual benefit of indigent patient, physician, nurse, dentist, and tax payer.

2. *Procedure.*

A. All authorizations for medical, nursing, and dental care shall be issued in writing for the local relief officer.

B. Medical care shall not ordinarily be authorized by relief administrations for conditions that do not cause acute suffering, interfere with earning capacity, endanger life, or threaten some permanent new handicap that is preventable when medical care is sought.

Dental care shall, in general, be restricted to emergency extractions and repairs.

3. *Fee Schedule*—The agreement between the state and/or local relief administration and the organized professional groups shall include a fee schedule covering the basic and special services. In the interests of simplified accounting, it is suggested that a flat rate be established on a per visit basis for the usual care given to acute and chronic illness; for attendance at confinement; for emergency extractions; for bedside nursing visits; and that all special services (medical, nursing or dental) be covered by an agreed reduction from the usual minimum fee schedule for such service with an agreed maximum fee.

All fees shall be established on the basis of an appreciable reduction from the prevailing minimum charges for similar services in the state and local communities with due recognition of the certainty, simplicity, and promptness of payment that authorization from the local relief administration insures.

Itemized bills for services are to be submitted monthly to the local relief official. All bills shall be accompanied by the original written order for such care.

4. *Medicine and Medical Supplies.*

A. Physicians shall use a formulary which excludes expensive drugs where less expensive drugs can be used with the same therapeutic effect.

B. Prescriptions shall be restricted to the National Formulary or the United States Pharmacopeia. To avoid excessive expenditures for remedies of unknown or doubtful value, proprietary or patent medicines shall not be authorized.

C. State and/or local relief officials are urged to make trade agreements with pharmaceutical organizations and druggists for uniform or reduced rates for prescriptions.

5. *Authority*—It shall be the responsibility of the state emergency relief administration to formulate a program of medical, nursing and dental care for indigent persons in their homes, which shall not be in conflict with the provisions of the federal regulations, and to make sure, by giving or withholding approval, that analogous programs formulated by local relief administrations shall not be in conflict with such state program.

6. *State and Local Professional Advisory Committees.*

A. State and local relief administrations shall request the presidents of state and local medical, nursing, dental and pharmaceutical organizations, respectively, to designate an existing committee or appoint a special committee, to advise them in the formulation and adoption of adequate programs for medical care.

B. The relief administration shall be responsible for the final adoption of such programs.

C. The professional advisory committees can assist these administrations in maintaining proper professional standards and in enlisting the cooperation of the constituent, professional membership in such programs.

D. Local medical, nursing and dental programs should be submitted to the appropriate professional advisory committee for comment before final approval is given.

E. The appropriate professional advisory committees should be consulted by relief administrations with regard to disputed problems of medical, nursing and dental policy and practice.

7. *Licensed Practitioners of Medicine and Related Professions.*

A. Participation in this program for medical care of indigent persons shall be open to physicians, dentists, and nurses licensed to practice their professions in the state, subject to local statutory limitations.

B. Professional persons authorized by relief officials to give medical care under this program shall have accepted, or shall be willing to accept, the regulations and restrictions inherent in such a program.

C. In order to provide adequate medical care it may be desirable for local relief officials to maintain on a district basis a list or file of physicians, dentists, nurses and pharmacists in the community who have agreed in writing to comply with the officially adopted program. Such a list should also facilitate a more equitable distribution of orders for medical services.

Because of the far-reaching implications in this program and the effect upon dental

(*Continued on page* 394)

SURGICAL DIAGNOSIS: THE SIGNIFICANCE OF PAIN

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IN this article the symptom of pain is stressed more than the picture of disease that may or may not be present in a particular case. It is self-evident that one should never make a diagnosis based on the symptom of pain, but it is also true that pain when considered as an entity is a great help in the diagnosis. Because pain is the factor that brings the majority of patients to the dental office, this should be reason enough to regard it of prime importance. The definition of pain is distress or suffering; moreover, it is relative. Patients will describe different pain symptoms. In most of the cases herein considered, the patients were sent to me because of pain symptoms only.

Report of Cases

Case 1—The same area was involved with regard to innervation and blood supply in cases 1 and 2. A local anesthetic was used in one case and a general in the other. Pain was present following the extraction of an inferior right second molar under nitrous oxide-oxygen anesthesia. Neuralgia was common to the entire area of the right side of the mandible and the region of the ear. Examination of the mouth showed a retained molar root with a fistula tract. Elevators were used for extraction, and postoperative treatment was instituted for the fistula.

The third day following extraction the patient complained of pain and soreness of the first molar when the tongue was placed against the tooth and pressure was exerted from the lingual side. Pain was not felt near the tooth on mastication or percussion. Thermal changes affected the pain symptom only on external application as the patient was careful not to have food come in contact with that side. On examination there was nothing in the appearance of the area to cause this complaint.

A study of the original roentgenograms revealed that the mesial root of the second molar was in contact with the distal root of the first molar; also, there was an exostosis of the mesial root. The operator in applying force to deliver the roots traumatized the pericemental membrane of the first molar root, and it was this that caused the reflex pain.

I suggested that the postoperative treatment consist of the application of a 5 per cent solution of silver nitrate with eugenol used to precipitate the silver. This was done with immediate relief.

The patient had been given treatments for a week for an osteitis, periostitis, or an infected dry socket; in fact, it was overmedication that caused the pain rather than not enough. The postoperative pain was worse than the preoperative symptoms.

Case 2—An extraction of an inferior right first molar was done under local anesthesia. The coronal portion of the tooth was fractured in the act of extraction, and an effort was made to remove the roots. This attempt was unsuccessful and the patient chose to have palliative treatments instituted and the roots extracted when soreness was not so great. Extreme pain persisted especially when the patient was in a reclining position. One week following extraction I was requested to examine the patient. At that time the involved area revealed no extensive laceration of the tissue nor did the retained roots cause any increased pain. According to the patient the pain was of the same nature that existed prior to extraction. The history showed that the first molar had been infected and had had a large carious process involving the pulp. The second molar had a gold shell crown and was sore to percussion, but this soreness was attributed to traumatic injury from attempts made to remove the roots of the first molar. A roentgenogram revealed an abscess of the second molar, and I advised the removal of the tooth. This was done along with the removal of the roots of the first molar. The pain ceased immediately.

The fact that extraction because of a pulpitis was indicated for the first molar should not have changed the diagnosis of the condition of the second molar, especially when a reclining position increased the pain symptom. The abscess was present on the second molar for some time and in my opinion the injury to the area during the extraction of the first molar caused the pain. When tissue that has acted as a defensive barrier to an infection has been traumatized the infection may change from a passive to an active one and destroy that barrier of defense. The retained roots could not have given the symptoms of pain that were present. The postoperative treatments instituted relieved the pain resulting from the traumatism on the first molar; therefore the pain in this case should have been the diagnostic symptom even though it was advisable to have roentgenographic evidence.

In case 1 there was neuralgic pain but only from external changes to heat and cold. In the second case thermal changes did not effect any change and the pain was different in nature and increased on reclining. The conditions in both cases were attributed to traumatic injury to the tooth adjacent to the one extracted.

In order to arrive at a diagnosis in a case in which the patient shows an extensive area of swelling on the external or internal surfaces, pain should also be given a great deal of consideration along with the other factor that would govern the diagnosis, such as an area of hardness or the opposite, signs of pointing and the extent of swelling.

The following is a report of a case in which there was an extensive area of swelling in the region of the ramus involving the superior triangle of the neck and one on the maxilla in which the area of swelling involved the entire right side from the alae of the nostril superior to and including the orbital cavity to the extent that the eye could not be seen.

Case 3—The patient, aged 8 years, had a large mass in the region of the angle of the mandible and involving the superior triangle of the neck. The patient complained of pain in the area common to the mass and the teeth of the right side. The swelling was of three days' duration and did not fluctuate although home applications mostly of heat were made.

The swelling appeared first and the pain followed; then trismus developed. The mass was hard and there was no indication of pointing. The mass extended from the angle of the ramus anterior to the mental foramen; the inferior border was the sternocleidomastoid muscle, and the superior border corresponded to a line from the angle of the mouth to the lobe of the ear. There was no pitting and the mass was freely movable. Internal examination showed all deciduous teeth and the first molar free from decay; there was no soreness on percussion. The child had in the past complained of toothache, but stated that the teeth on that side began to hurt after the swelling had started. This was evidence that the condition was not one of dental origin.

Roentgenographic study both intra-orally and extra-orally did not show any evidence of a pathologic condition. After consultation with the family physician the patient was hospitalized for an operation. Incision was made at the angle of the ramus down to the periosteum and drainage tubes were inserted; there was no discharge of pus and at no time following operation was there any exudate. The temperature and pulse rate returned to normal following operation. Drainage tubes were retained for a period of seven days.

Since there was no family history of

any pulmonary disorder either in the parents or grandparents, a tuberculous gland was not considered as a possibility. A diagnosis was made of cervical cellulitis and infectious mononucleosis.

Infectious Mononucleosis

Nomenclature—The disease now known as infectious mononucleosis is probably the same condition that in 1889 was spoken of as glandular fever. The fact that the disease has been designated by two such dissimilar names arises from a natural and logical sequence of events. The recognition of disease depends on the recognition of its symptoms or manifestations, and one of the most striking manifestations of infectious mononucleosis is a diffuse and generalized enlargement of the lymph glands, which are more properly termed lymph nodes. It is not surprising that the disease should have been called glandular fever, for at that time methods for the systematic examination of the blood were either new or yet to be discovered. As such methods were evolved it became recognized that the disease was accompanied if not characterized by definite changes in the blood, which in all probability have a definite connection with the glandular enlargements from which the earlier name of the disease was derived.

Symptoms—Mononucleosis is a disease with characteristics so striking that it is strange that it should have been so confused with others to which it presents a more or less superficial resemblance. While at first it was thought to be a disease peculiar to children, it is now recognized as a condition common in adults, usually in the early twenties. Like many other diseases, it begins with languor, headache, fever, and perhaps chills. These are soon followed by sore throat, hoarseness, and a cough. The most striking external evidence of the disease, however, makes its appearance in the first week in the shape of swelling and tenderness in the lymph nodes. This may be seen only in the neck or cervical region, or it may be more diffuse and involve also the lymph nodes in the armpit or those in the groin or even the isolated nodes in the bend of the elbow.

As lymph nodes are scattered throughout the interior as well as on the surfaces of the body, when the deep nodes are affected there may be abdominal pain and tenderness suggestive of appendicitis. An examination of the blood discloses definite changes in the leukocytes, and a leukocytosis. Microscopic examination of these cells will show that this increase in number is not one of a general increase in number of all kinds of leukocytes, for the granular forms may actually show a decrease in number, but the increase in cells is due to the appearance in the circulating blood of large numbers of nongranular leukocytes of lymphoid type, the so-called monocytes. This evidence of disease lasts from ten to twenty days, when the symptoms decline and the patient proceeds to an uneventful recovery.

Etiology—While the exact cause of this disease remains to be discovered, there is logical basis for the supposition that it is due to an infection from some unknown agent; hence the name infectious mononucleosis.

Diagnosis and Treatment—The fact that its pathologic manifestations are considered in this manner means that in arriving at a diagnosis, osteomyelitis must be considered under differential diagnosis. The diagnosis was cervical cellulitis and infectious mononucleosis. Medical care was advised and instituted.

Case 4—A woman, aged 23, had had the superior right lateral incisor extracted under general anesthesia, because of an abscess. Forty-eight hours following extraction the face became swollen. The pain was distinctly throbbing, and medication gave no relief. The mass was diffuse and soft with no indication of external pointing; internally the area of recent extraction revealed no distinct pathologic lesions. Curettement had been done previously. Operation (incision and drainage) from the muco-labial fold to the inferior border of the orbit reduced the temperature and also a bloody discharge which resulted from the operation. A diagnosis of osteomyelitis was made.

In case 3 there was pain and trismus resulting from the swelling. In case 4 pain was the first symptom. In case 3 the mass was hard and there was limited diffusion. In case 4 the mass was soft and there was great diffusion.

Case 5—A woman, aged 26, presented a history of having experienced overnight a swelling underneath the anterior two thirds of the tongue more to the left side than the right. There was no pain except as a sense of discomfort when trying to talk or eat. Home remedies afforded no relief. The mass became so large that medical attention was given and the patient referred to the family dentist for consultation. Examination showed the oral cavity in poor hygienic condition and extensive gingivitis was present especially at the anterior teeth. Swelling was present and extreme pain was felt. Careful consideration was given to the time the mass first appeared. I did not agree with the diagnosis of an abcess as being the

Facial Neuralgias

I. FRAZIER'S CLASSIFICATION:

A. Neuralgia due to infection of the teeth and sinuses, which involves a more or less constant, throbbing pain that subsides with the inflammation.

B. Postherpetic neuralgias, with a history of rash, constant in character and associated with hyperesthesia of the skin.

C. Neuralgias due to tumors of the gasserian ganglion.

D. Painful phenomena of the face which are associated with hemicrania or migraine.

E. Atypical neuralgia.

F. Major trigeminal neuralgia.

II. DESCRIPTION OF ATYPICAL NEURALGIA:

A. Distribution
1. Pain not referred to peripheral distribution of nerve.
2. Pain not related to anatomic distribution. It will jump across from one zone of the three divisions of the trigeminus to another, but never to the periphery.
3. Pain extends beyond the trigeminal territory, behind the ear to the submaxillary region, to the shoulder and arm.

B. Character
1. Pain is described as drawing or pulling; feeling of pressure or tension.
2. Burning, boring, or throbbing rather than cutting, stabbing or tearing.
3. Deep seated, not superficial or terminal.
4. Constant, not intermittent or paroxysmal, though varying in intensity.
5. Relieved by opium. Often as severe by night as by day.

—Wilson, D. C.: Atypical Facial Neuralgia, J. A. M. A. 99:813 (September 3) 1932.

prime factor. The diagnosis of a stone in the duct was proved at operation.

I have previously reported a similar case[1], which gives details that can be applied to the present case with regard to operation.

The extreme pain and swelling noted at the time of the dental examination in case 5 were due to the home remedies. The main factor that suggested the diagnosis of abscess, however, was the presence of pain. It should be remembered that *an abscess causes pain at the start and not after the swelling occurs.* In case 5 pain was the last symptom. Case 6 represents a condition in which there is pain without a history of swelling. Extraction was done for relief of the pain without results.

Case 6—A man, aged 23, had pain in the upper right maxilla. Every time he walked the pain became throbbing in nature, and in the pursuit of his duties as a truck driver the jar of the wheels on the road intensified the pain. Extraction of the superior right first molar gave him temporary relief from pain but a severe hemorrhage resulted. Examination of the area of recent extraction was negative. Test for thermal changes and roentgenograms of the second molar and bicuspid (the third molar had been extracted previous to the onset of symptoms) did not reveal anything. The second molar did have a cavity on the distal surface but there was no pulpal involvement nor recession of the gingival tissue on the buccal surface. Transillumination showed the sinus to be normal. A diagnosis was made of osteitis of the superior maxilla in the region of the antrum.

Case 7—A truck driver, aged 30, was referred because of severe pain in the region of the symphysis. Treatments were administered to the teeth and the gingivae without relief. A gastro-intestinal disturbance was present along with the symptoms of severe pain. Extraction of the central incisors gave no relief of the pain and resulted in aggravating the gastritis. There was a discharge of pus from the area of recent extraction. A diagnosis of osteomyelitis was made. Operation was performed with ligation of the lateral incisors and cuspids to aid in osteogenesis.

The pain in cases 6 and 7 was similar in nature and degree except that one patient stated that jarring of the body increased the symptom and reclining decreased the pain. The other patient had the same amount of pain standing or reclining; a change of posture did not affect the severity of the pain. Tenderness was localized in case 7 and general in case 6.

I have tried up to this point to refer to cases in which roentgenograms were used but were not necessary to arrive at a diagnosis, because the pain symptom was the cardinal point. In many cases the study of roentgenograms will not assist in making a diagnosis, especially in osteomyelitis at the first stage, or in cervical cellulitis.

Case 8—A woman, aged 20, had an inferior right second molar extracted under gas anesthesia. Four days following the extraction the patient was unable to eat any solid food because of edema of the throat on the side of the extraction. There was no history of any severe pain following the extraction; the edema was noticed only on the morning of examination. Examination showed a large mass on the lingual surface of the alveolar ridge bordering the area of recent extraction and involving the area of the right tonsil. The mass indicated pointing at its inferior border. Incision released a quantity of serous exudate and pus. Roentgenograms did not reveal retained roots nor a fracture of the alveolar crest. A diagnosis of peritonsillar abscess and cervical cellulitis was made. The pain in this case resulted from the edema and was in no way associated with the teeth.

Case 9—A man, aged 24, was under medical treatment for anemia. He was referred for general dental examination and instruction to establish oral hygiene. The superior second and first molars and first bicuspid were extracted. The patient did not inform the operator of his systemic condition nor was contact established with the physician. Four days after the extractions the patient presented himself with an extensive lymphadenitis and glossitis. Examination showed no reason for the condition to be associated with the dental treatments either from a preoperative or postoperative cause. The patient made a good recovery when confined to bed.

In a condition such as that described in case 9 it is not only necessary for the operator to assume the responsibility of the extraction, but he should be equally as well prepared to institute treatment for that which may follow. The physical condition is a factor to be considered but is not sufficient, because the oral condition could and does occur in the absence of an anemic condition. In cases 8 and 9 the diagnosis and treatment could have been carried out without the roentgenograms. The pain symptom of an abscess and a glossitis is entirely different.

Case 8 illustrates that a point of suppuration may be present in the oral cavity without a lesion to indicate a relationship to dental origin, and without positive evidence that teeth are the cause of the symptom. Case 9, by way of comparison, shows that a superperiosteal infection does occur and the lesion involves the teeth common to that area to the extent that the molars must not be extracted. These cases show the necessity of trying to arrive at a diagnosis rather than to treat symptoms.

Case 10—A woman, aged 22, gave a history of swelling on the palatal portion opposite the area of the second and third molars which had been extracted during the past two years. The anterior border of swelling was the palatal root of the first molar and the posterior border, the soft palate. The mass was hard at the periphery and soft in the center, rather vascular, and the patient stated it appeared to be becoming larger within a period of twelve hours. It was present for the past week with only pain on pressure from food or applied force. Palpation of the buccal surface was negative and there was no soreness on percussion of the first molar. Transillumination of the sinuses did not reveal anything. A diagnosis of a non-suppurative palatal granuloma was made.

Incision, curettement, and application of a counter-irritant comprised the treatment.

Examination of the contents from the involved area revealed a small portion of a foreign body that resembled a tuft of bristle from a toothbrush. The patient was not aware that this foreign body had remained in the mouth.

Conclusion

It is of paramount importance that one should obtain a definite and complete history before attempting to affect a cure. An understanding of pathology is more to be desired and sought for than a surgical technique.

[1]Buchanan, J. C.: Case Report of Ranula and Sialolithiasis, Internat. J. Orthodontia, Oral Surg. & Radiog. **15**: 810-812 (August) 1929.

First National Bank Building.

(*Continued from page* 391)

practice the editor of this magazine urges members of the profession to comment on this significant undertaking. Expressions of opinion from a number of dentists throughout the country should be of great value to dental organization officers who will be asked by local relief administration officials to cooperate in this program.

All readers are urged and invited to comment on this subject. Please address correspondence to Edward J. Ryan, D.D.S., 708 Church Street, Evanston, Illinois.

The DENTAL SCENE

OSWALD AND THE DENTIST

LITTLE Oswald has grown to be a great big boy. Mammy and Pappy scraped together enough money to send him away to college where he studied commerce. Oswald was never so torrid in the classrooms but he was a big he-man on the campus and along fraternity row. Oswald was never strong on facts, but he was a convincing talker nevertheless. When in any doubt on any issue Oswald thundered, gestured convulsively, orated, and sprayed his listeners with his personality. There was a bit of the hollow ring to Oswald but he had what it takes to go a long way in the bond business.

After a few years in the financial world Oswald heard the call to arms, as he said, "to a wider field of service." He entered upon a political career and with his talents for oratory and his proud disdain for facts he made a spectacular ascent. In the course of time he was elevated to the royal purple and was elected to a high executive position. Little Oswald had become The Honorable Oswald. Mammy and Pappy and the brothers in Zuta Zuta Bama were proud indeed.

Since his college days Oswald had always had a fierce hatred for Mr. Adam Smith, Mr. John Stuart Mill, Mr. Ricardo, and all other past and contemporary economists. In fact, he had regularly flunked his courses in Econ. I, II, III, and so on. So Oswald was by instinct and training the boy to construct a new social and political order. He gathered about him a group of exophthalmic gents who had grown flat-footed on soap boxes and set out to abolish poverty, capitalism, greed, individualism, laissez-faire, the price system, competition, and other vestiges of the economic order. Red flags and black shirts irritated Oswald's esthetic sense so he called his ticket to utopia simply, Oswald's Resuscitation Panacea; the ORP for short.

Os, as his back-slappers called him, developed a sore right hand from squiggling his name on a stack of documents that would make his ORP constitutional and all that. Os took a fiendish delight in signing the large document, THE REGULATION OF DENTAL PRACTICE. In fact, he sneered malevolently before the movie cameras when he signed this paper. But only a wise psychoanalyst or one of his neighbors in Totem Creek would know the reason. It was one of those juvenile fixations, or some such thing, or maybe a repressed desire. At any event, Old Doc Smitherskin had kicked Little Oswald on the back of the lap for stealing apples and had before that charged Oswald's Mammy and Pappy two dollars for playing and coaxing for a couple of hours to put a filling in their little boy's tooth. At the time, Pappy had opined that it was robbery and Mammy said, "Something should be done about it." Now, after all these years, their big boy was going to do something.

The ACT FOR THE REGULATION OF DENTAL PRACTICE was a bit more severe than other legislations under the ORP for, we must recall, back of it was a juvenile fixation, a repressed emotion, or some other horrible thing. In its starkness, after "whereas" and "Be it resolved" were stricken out a countless number of times, the ACT provided the following: An increase in the price of gold used in dentistry to $60.135 per ounce; a tax of $2.07 on each and every mix of cement; a sales tax payable by the dentist of $72.11 on every prosthetic appliance; a public utility excise fee of $4.63 per hour for electricity used in x-ray machines, dental engines, sterilizers; a monthly state board examination that required the construction of a continuous gum denture, an M. O. D. gold foil in an upper third molar; the removal of an impacted tooth in less than two minutes. Furthermore, the ACT provided that an Arbitration Board be established composed of one dentist and eight laymen to conduct hearings on complaints of unfair dental fees. For any dentist who violated the CODE OF DENTAL FEES of 190X B.D.* the punishment was a fine of $10,000 payable in gold. To protect consumers under the ORP it was provided that fees for dental services were payable seven years after the date of such services to guarantee "satisfaction and permanency of said services." All in all, Oswald and Sergeant Boswell, the Administrator of the ACT were satisfied with everything.

*Before Depression

For the first three or four months after the DENTAL ACT became effective the only protests that came to Sergeant Boswell were from dentists and a smattering of sociologists. The complaints from dentists were dismissed with the epithet "kulaks," borrowed from Mr. Stalin with whom Sergeant Boswell was secretly *en rapport*. The sociologists were, of course, bellyachers who didn't have jobs with the Administration.

But Oswald reckoned without knowing his biology. Death, Taxes, and Toothaches are the inevitable Triumvirate. When the wind was right Oswald's slumbers in the Executive Home were disturbed by the wailing in the slums of children with toothache. He took the matter up with the Weather Bureau and issued an executive order that the wind must be changed to blow in from the sea at all times. Oswald's wife, who had founded a Junior League Dental Clinic in Totem Creek was conscience stricken and pleaded that dentistry for children should be exempt from the CODE. But Oswald was a shouting, two-fisted-desk-pounding executive and could not be deflected. He was constructing a planned state and no sentimental woman should interfere.

Later on, Oswald noticed that at public receptions and along the streets many people were appearing with curiously swollen faces and some with bandages around their heads. He asked his Chief Surgeon about this new malady and was told, because the surgeon needed his job, that this was a new form of Hoof and Mouth Disease underwritten by the Opposition Party. It was a pretty dirty trick even for politicians, Oswald thought.

Excited delegations from the packing industry, the fruit growers associations, and the food manufacturers began to call on Oswald complaining that the ORP wasn't working according to schedule; that the people were not buying foodstuffs with their increased earnings. Efficiency ex-

perts from the steel, automobile, and textile industries came and said that even with shorter hours of labor their workers were slower, there were more accidents; there was more absenteeism; production was deficient in both quality and quantity. In fact, one upstart of a physician from one of the delegations spoke up and said, "Our workers are suffering from malnutrition because they cannot chew their food. They are inefficient because they are being undermined by infection. They are absent from work because they, or some members of their families are awake all night with pain." This gave Oswald a moment's reflection. After this delegation had gone a pleasant secretary handed Os a card showing the confidential record of the physician who had spoken: Twenty-three years, six months and seventeen days ago this physician was elected coroner of a county on the opposition ticket. So that was that; more propaganda.

Tradition requires that our executives be folksey people, poor boys who studied by candlelight or came up from the city's gutters. A few who possessed neither the full-toothed smile, the firm handclasp, nor the gift of tongue were strong, silent men with granite in their souls. Oswald was an extravert, a man of the people, the verbal and bodily type of executive.

Each year Oswald made a homecoming to Totem Creek—human interest appeal. With a blaring of trumpets, the prancing cavalry, the salute of guns, he was returning now, not as Little Oswald the Town Pest, but as Oswald the Chief. The streets and store fronts were heavy with bunting, with pictures of his campaign face, with the insignia of ORP. Totem Creek was ajitter, but a bit sullen for a home town crowd.

The special train came into the station. All eyes were turned toward the observation platform. Aides opened the door leading to the platform; aides in braids and brass buttons. The hometowners were quiet; even the members of the band in their multicolored uniforms forgot to play. Then Oswald stepped forward, gave his toothy smile, a vigorous wave of the arms, and waited for the hurricane of applause. The applause came but only in the proportions of a mild wind. The folks at Totem Creek had let him down, Oswald mourned. Well, "a prophet was without . . .," he rationalized.

Zeb Harris, Mayor, had misery with his rheumatism that day and had trouble climbing the steps to the platform to welcome the home town boy who was recasting the country. Then Oswald observed that the same epidemic of swollen, painful faces had struck Totem Creek. The people didn't look any too well, he thought. What he would say in the next campaign about the tactics of the opposition!

Mammy and Pappy were not at the station to meet their big boy. The news reel shots of Mammy in apron welcoming Os at the front door and Pappy with his suspenders showing would make a more folksey scene, Oswald had planned in advance. So the big Shell from Totem Creek got in a touring car and proceeded down Main Street. He poured smiles and neighborly greeting upon the populace in the best bond salesman's manner. Swollen faces, toothless faces, faces in pain stared at him with awe and dilute enthusiasm. The children along the route ("Our dear kiddies" of Oswald's radio harangues) were listless, skinny, and white of face. Even the bunting was faded.

Oswald hardly recognized Mammy. He kissed her concave mouth. Then he stood off and looked at her. Something had happened to Mammy's face; it was sort of caved in. She was, in fact, quite toothless. This movie shot would be very embarrassing to Oswald. Mammy should have had something done about it.

Pappy was in bed; quite drunk, thank you. Not that Pappy was a hard drinking man, but somebody had told him that whiskey was a specific for toothache, and he had taken the maximum dose.

When Mammy and Pappy and their big boy were alone, Oswald in irritation said, "I want both of you to go to a dentist tomorrow morning and have something, everything you need, done. I'll pay all the bills."

"But," said Pappy, "There ain't a dentist within five hundred miles."

"What," barked Oswald, "no dentists? Where's old Doc Smitherskin and the rest of those robbers around here?"

"Doc Smitherskin," answered Mammy, "is running a beer tavern down on Main Street."

"And the other dentists in these parts," added Pappy, "are driving taxis, pumping gasoline, running errands, or are clients of the relief agencies." Pappy spoke his speech with irritation; but maybe it was the whiskey. He was always a touch more positive when in his cups.

That night Oswald went to bed in his parent's home but sleep didn't come. After he had tabulated four thousand sheep a rumbling began in his head. The rumbling took on the character of an indefinite pain, the pain jumped back and forth, up and down the left side of his face. Then the indefinite pain became very definite and a thumping, jumping pain began in his upper jaw. Then it singled out one tooth and began to work in earnest. Thump, bang, jump with every heart beat. Oswald called for his aides, his secretaries, his personal physician. They tried everything—hot water bottles, ice packs, mustard foot baths, suggestion, sympathy, and whiskey. Oswald, the man of action and iron, became completely mortal. He cursed, he cried, he held his face. Cold sweat grew on his brow. He was not such a commanding figure in his long, white nightgown as he paced the floor.

Oswald, with Mammy, Pappy, his aides, secretaries, reporters, cameramen—all went to Doc Smitherskin's beer tavern. The dentist was alone, polishing the bar, preparing to close for the night. When the whole mob stomped in, Smitherskin prepared to draw a lot of beer. Business looked good.

"Hello, Doc," said Oswald with more cheer than he felt.

"Oh, it's you, Oswald," answered Smitherskin, stunned by such friendliness from the great man.

"Doc, I'm happier to see you than any man alive," said Oswald with candor.

Oswald must truly be balmy, as many folks said, was Doctor Smitherskin's private opinion.

Smitherskin closed the beer tavern and the group went to his dental office which had been closed these many months. They all pitched in—aides, secretaries, reporters—to clean the dust and cobwebs from the dental equipment. Doctor Smitherskin had taken off his bartender's apron, washed the beer from his hands, and now went to work on Oswald's upper left first molar. Relief from the throbbing, jumping pain came to Oswald in a few minutes. Oswald smiled his toothy smile, and all the aides, secretaries, and reporters applauded. A great healing had come to pass.

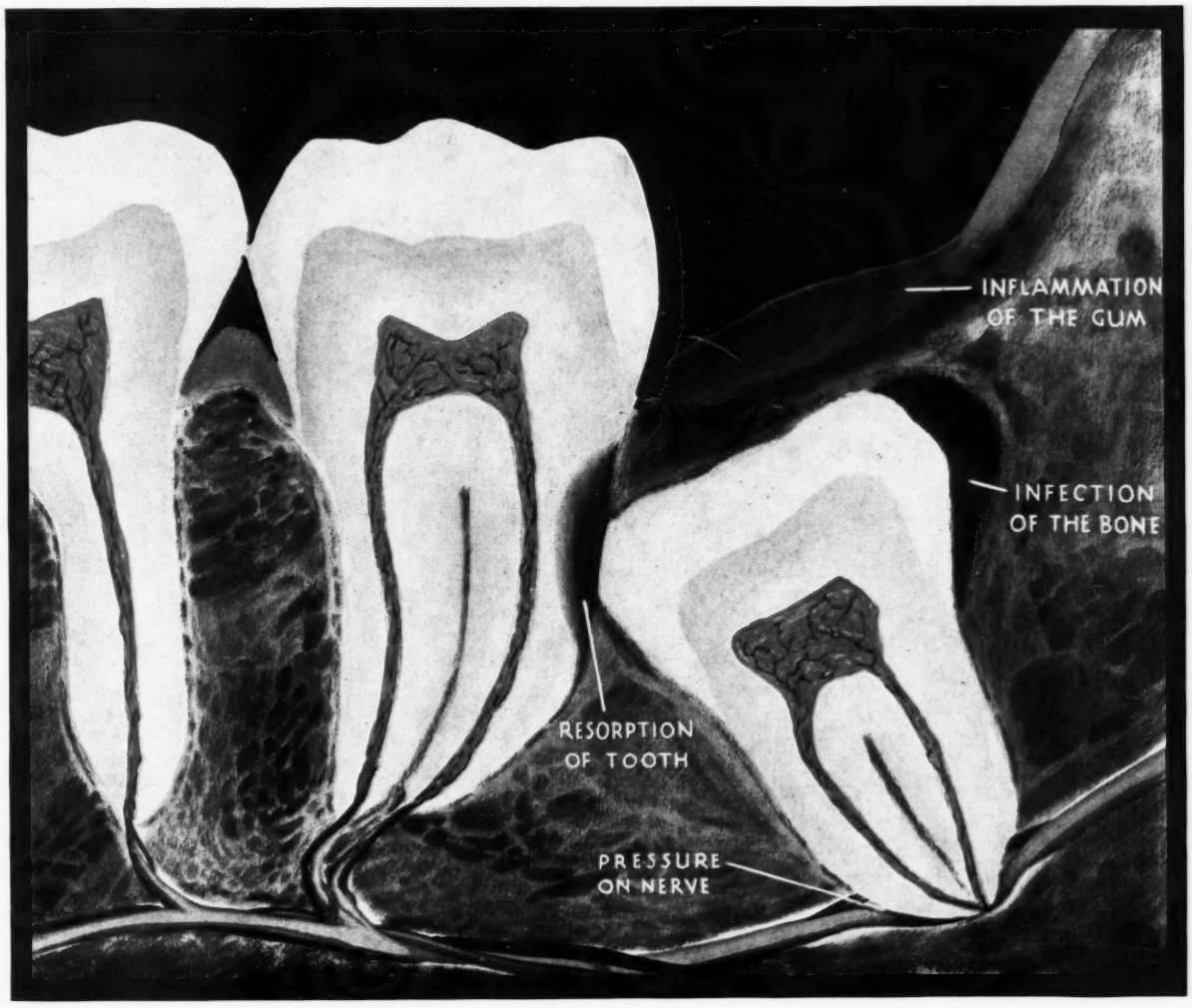
The next day at his press conference, with customary oratory and vigor, Oswald spoke feelingly of the health of "our people," and announced that the ACT FOR THE REGULATION OF DENTAL PRACTICE was rescinded. This was the first of the many documents of the ORP headed for the scrap heap, and so the people began to hope.

At the next election Oswald was by an overwhelming vote elected to stay home. He returned to Totem Creek to write his memoirs and to do some whittling. As if anybody cared what he did.

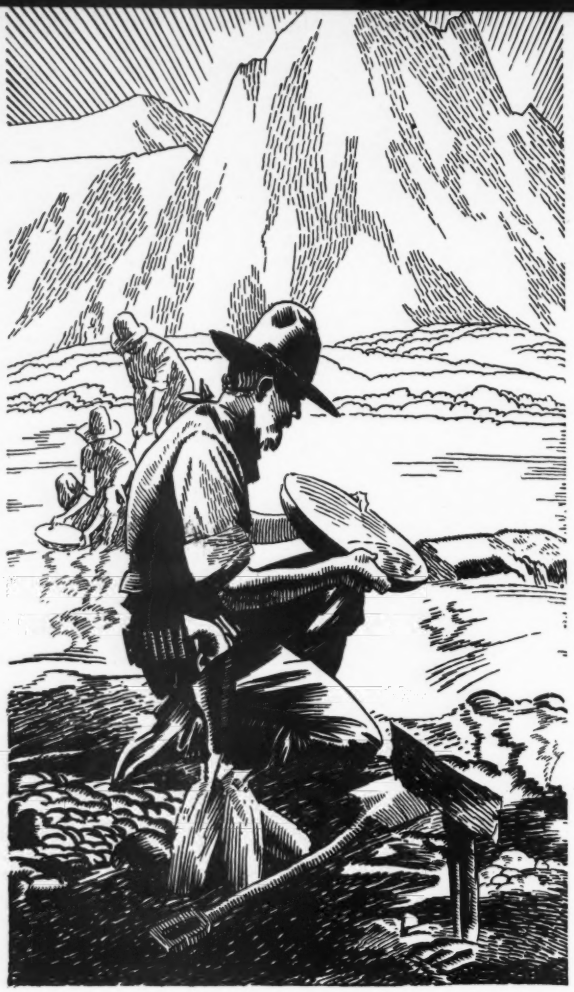
E. J. R.

THE EDUCATION OF THE DENTAL PATIENT*

VI. THE DANGER FROM THE IMPACTED TOOTH



*This is the sixth of a series of charts intended for the use of the dentist in explaining important normal and pathologic dental conditions to his patients.



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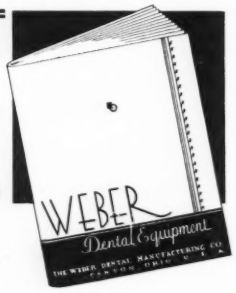

The Weber Dental Mfg. Co.
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Gentlemen:
Please send me free your new catalog. I am particularly interested in
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The Weber Dental Mfg. Co.

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Export Office: 149 Broadway, New York City

THE PUBLISHER'S NOTE BOOK

THIS afternoon I have been looking over the last eight issues of THE DENTAL DIGEST, and it occurred to me to count the number of text pages we have printed in these numbers of the magazine.

About two thirds of the printed area has been devoted to text, 204 pages in these eight issues. Aside from advertising pages, therefore, THE DIGEST has published in eight numbers the equivalent of a 400-page book, since DIGEST pages are about double the size of the average book page. A 400-page book is quite a thick volume; the average novel runs to about 300 pages.

Since publishers are commercially-minded souls, it is not surprising to find this one using the back of an old envelope to figure that the subscriber, paying $2 a year for the magazine, buys each issue for a bit less than 17 cents—that the eight issues I've been analyzing, which contain as much text as a 400-page book, have cost only $1.35.

And, perhaps few dental textbooks carry as many elaborate illustrations—in black and white and in color—as appear in eight numbers of this journal.

Still unashamedly commercial, I can't resist pointing out that THE DIGEST subscriber has purchased his 400-page, profusely illustrated textbook for a third to a fourth what he would pay for a dental book of the same size and character.

Yet, now and then, someone attacks us vigorously for printing advertising in the magazine. At the Dental Congress in Chicago a dentist patiently outlined to me the reasons why we shouldn't publish advertisements at all.

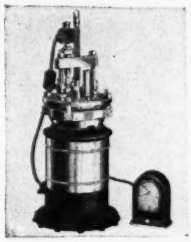
I asked him if he wished to pay $8 to $10 a year for his DIGEST. He promptly said, "No! I can only afford the $2 you ask."

But I didn't succeed in making him see *why* he was able to buy the equivalent of an $8 to $10 textbook for $2.

* * *

Several times monthly we are still obliged to apologize for late delivery of the magazine, which is really scheduled to appear on the fifteenth of the month of issue. From the beginning, the color printing has delayed us each month. It has not been easy to pioneer this type of work in the dental field. But we *hope* before very long to overcome this delay and meet our delivery date religiously.

Merwin B. Massol, *Publisher.*



The New Edson
Vulcanizes, presses, moulds or cures practically all denture materials.

Are YOU in Step with Progress?

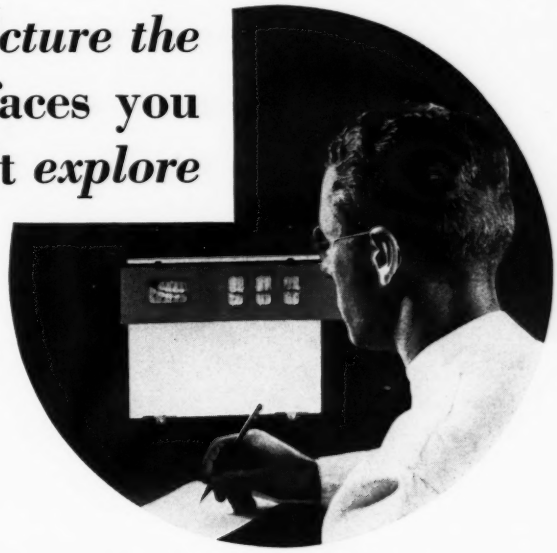
New denture materials require new technic and modern equipment. The dentists and technicians who are getting RESULTS are using new Buffalo Dental Vulcanizers—the same make of machines actually used and recommended by the manufacturers of all of the thermo-cured resins. Send for your copy of the latest bulletin on Buffalo Vulcanizers.

See coupon on page 408

BUFFALO DENTAL MFG. CO.
Kehr & Urban Sts. Buffalo, N. Y.

NRA WE DO OUR PART

Picture the surfaces you can't explore



60 INTERPROXIMAL surfaces defy instrumental examination. They present 60 opportunities for decay to get a foothold before it is detected . . . 60 chances for your patient to regard you careless.

But these surfaces can be examined. The very first indication of decay can be discovered. And the cavities can be given the attention that thorough preventive dentistry requires, at the most effective time.

By using *Bite-Wing* films and directing the rays slightly above the occlusal plane, undistorted images of the interproximal surfaces appear in the radiograph. Carious areas can be immediately detected because attention is concentrated on the coronal two-thirds of the tooth.

Only 5 Films Needed

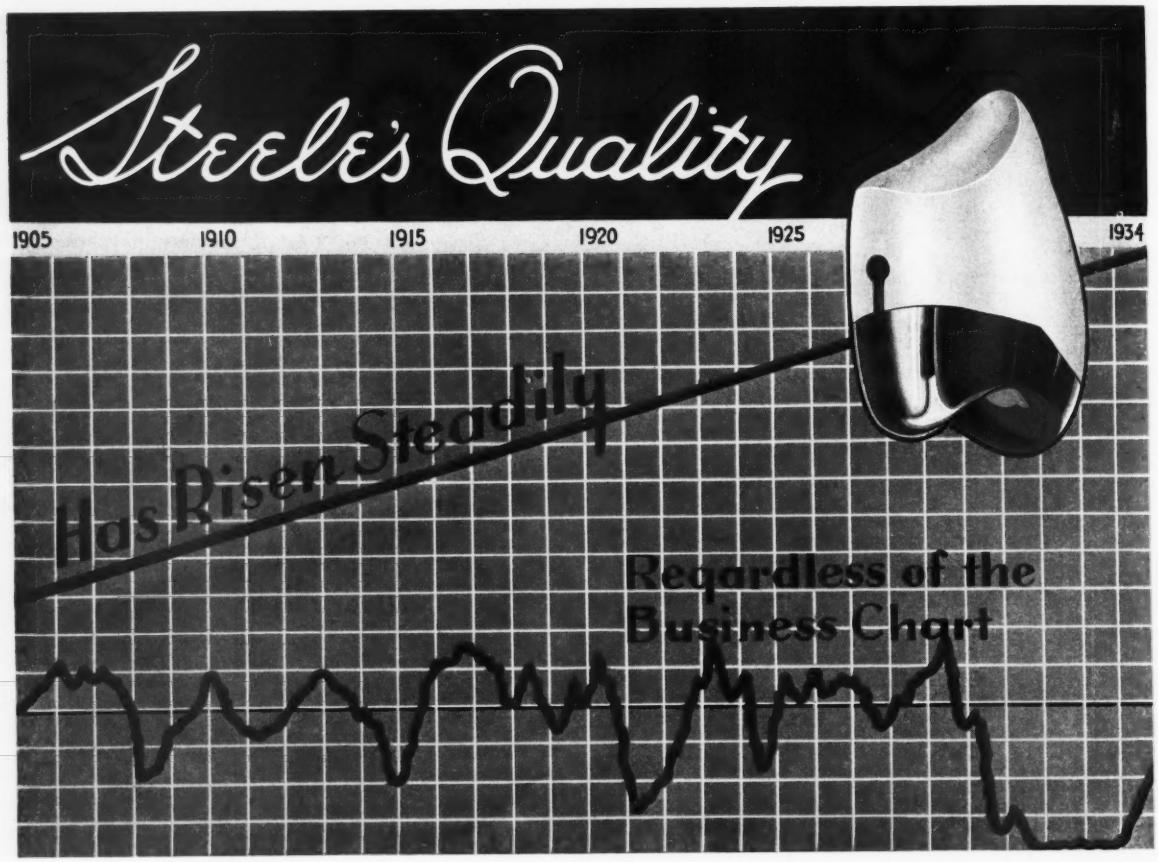
Every complete annual dental examination should include *Bite-Wing* radiographs. In addition, they should be used to check the seating of inlays, the gingival margins of restorations, the proximity of excavation to the pulp. Only five films are needed for the *Bite-Wing* examination. It is quick, inexpensive . . . facilitates your work and holds patients' confidence.

Mail the coupon on the right for a free sample of Bite-Wing Films and a copy of the lay educational booklet, "How to Prevent Toothache."

EASTMAN KODAK COMPANY, *Medical Division,*
345 State Street, Rochester, N. Y.
Gentlemen: Please send me a free sample of *Bite-Wing* Films and a copy of the booklet, "How to Prevent Toothache."

Name .....
No. & St. .....
City & State .....

or use coupon on page 408



Once Used Always Preferred

QUALITY is more in demand today than ever before. Depression periods witness "cut price buying orgies" which naturally result in cheapened merchandise.

Steele's quality has been continually maintained and improved since the original Steele's was made in 1902. STEELE'S STANDS FOR QUALITY.

WRITE FOR FREE "UP TO DATE" TECHNIC BOOK

Use coupon on page 408

THE COLUMBUS DENTAL MFG. CO. Columbus, Ohio-U.S.A.

105 SEPARATE TESTS

THE contents of each tube of Pepsodent Tooth Paste undergoes 105 separate and distinct tests. That seems unbelievable but it is a fact. Remember this when you tell your patients to use Pepsodent. It is important that millions of tubes are made under the same scientific control that exists in the smallest laboratory quantity. When teeth are at stake no precaution is too great. Why recommend any tooth paste less scientific?

THE PEPSODENT CO., CHICAGO

NRA WE DO OUR PART

No Patient Will Regret Paying a Higher Fee For a Denture of

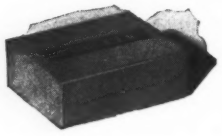
LUXENE

The Translucent BAKELITE Denture Material

SO outstanding are the advantages of Luxene that once you have realized their full import to the health and comfort of your patients you can well question whether it would be ethical to withhold from them the knowledge of these advancements in hygienic and esthetic qualities which science has evolved for their benefit.

That knowledge naturally will prompt you to recommend Luxene for all new denture cases. But their number is insignificant compared to those whom you know to be putting up with the discomforts and offensiveness of old-time dentures because they do not realize there is any alternative.

It is these patients who will experience the greatest relief and derive the utmost satisfaction from a perfectly fitting, natural appearing and *permanently sanitary* Luxene denture—and willingly pay more for it. To inform them of the availability of such a denture is to render them a real service.



But remember—only Luxene is genuine BAKELITE. For your patient's protection, as well as your own, be sure every Luxene denture you order is delivered in the original fawn-colored LUXENE container.

●

The LUXENE DEMONSTRATOR

provides an effective means of presenting the advantages of this lustrous pink Bakelite denture base to your patients. It comprises a specimen Luxene denture and fifty ethically-worded announcement cards in an attractive case, as illustrated.

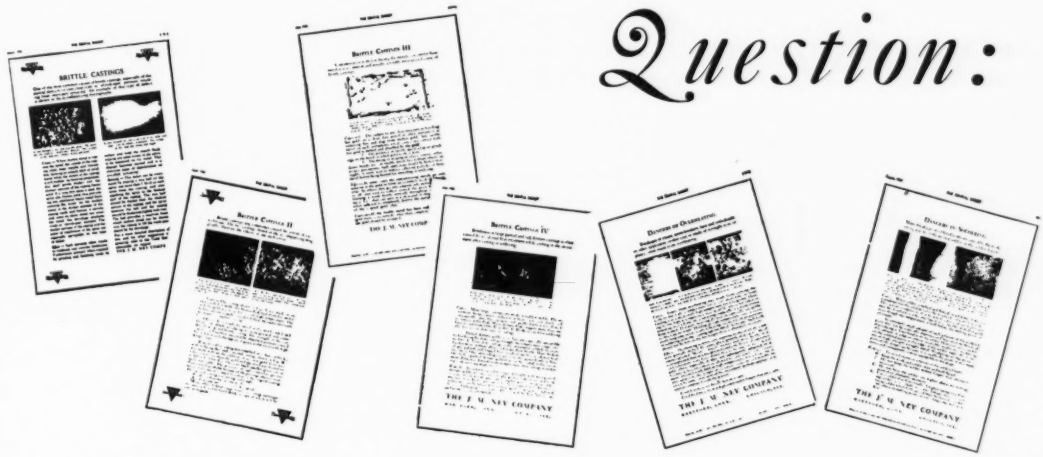
Your dealer or laboratory can supply

THE RANSOM & RANDOLPH COMPANY

TOLEDO, OHIO

Please let us have your answer to this

Question:



Shall we reprint this informative series?

FROM March to August inclusive we have published a series of six articles in this magazine covering major problems encountered in the casting, heating and soldering of gold. An increasing number of requests has come to us for reprints of these articles in booklet form.

Are you interested in receiving such a reprint?

We are going to be guided by the wishes of the readers of *"Dental Digest"*. On page 408 of this issue you will find a coupon which you can mail to us to register your interest.

For convenience use the reply coupon on Page 408

THE J. M. NEY COMPANY

HARTFORD, CONN. CHICAGO, ILL.

STERILIZED BOTTLES

ENDLESS chains of bottles – millions of them–and all thoroughly washed and finally cleansed with live steam before they are filled. This is just one of the many careful steps taken in the manufacture of Pepsodent Antiseptic. It is typical of the care taken in the manufacture of *all* Pepsodent products. The Pepsodent Company stands high in the estimation of the profession–and it is jealous of that distinction.

THE PEPSODENT CO., CHICAGO

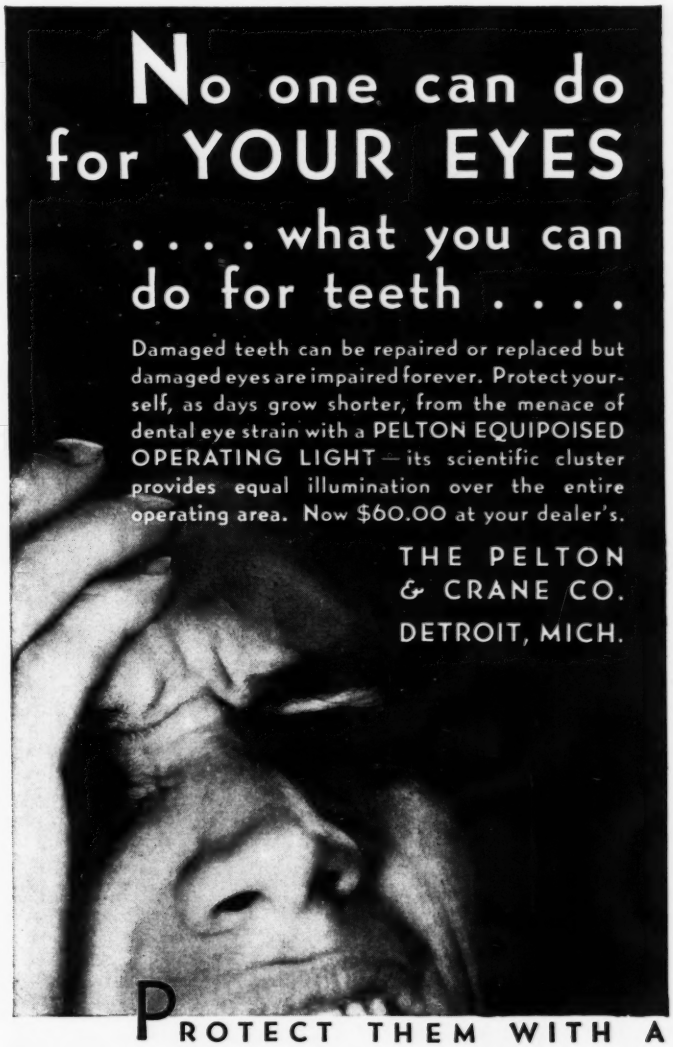
"DENTAL ORAL SURGERY *has helped me considerably*"

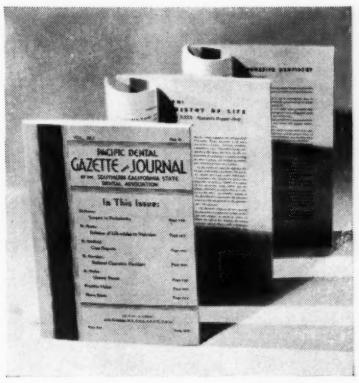
"A few months ago I purchased a copy of DENTAL ORAL SURGERY and now, since I have read the book thoroughly, I can truthfully say that this investment was one of the best I have ever made. It is a remarkable book and I refer to it regularly in my practice."

You, too, will find that the purchase of DENTAL ORAL SURGERY is an investment and not an expenditure. It describes Doctor Cogswell's unique exodontia technique completely. The technique is illustrated adequately step by step with illustrations which really show what the author wants to pass on to his colleagues.

The price is only $10. The coupon on page 408 is for your convenience. Clip and mail it today.

THE DENTAL DIGEST
1005 Liberty Ave.
Pittsburgh, Pa.


No one can do for YOUR EYES
. . . . what you can do for teeth . . . .
Damaged teeth can be repaired or replaced but damaged eyes are impaired forever. Protect yourself, as days grow shorter, from the menace of dental eye strain with a PELTON EQUIPOISED OPERATING LIGHT—its scientific cluster provides equal illumination over the entire operating area. Now $60.00 at your dealer's.
THE PELTON & CRANE CO.
DETROIT, MICH.
PROTECT THEM WITH A
PELTON LIGHT



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THE GAZETTE OF 1933

Modern in presentation. Filled with the latest constructive dental material. A true servant to dentistry for forty-one years. Always offering the most progressive information to its readers. You will enjoy reading the Gazette.

Special Offer—18 Months $1.50

(For the one year price—6 months free.)

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See second cover D.D.10
SPYCO SMELTING & REFINING CO.
51 SOUTH THIRD ST., MINNEAPOLIS, MINN.

Please send me: Physical charts and other information on Tinker Golds. ☐
A copy of the Spyco Tempering Booklet ☐

Dr. .....

Address .....

City .....

See page 400 D.D.10
WEBER DENTAL MFG. CO.
CANTON, OHIO

Please send me your new catalog. I am particularly interested in Units ☐ Engines ☐ Chairs ☐ Lights ☐ Cabinets ☐ Cuspidors ☐ X-Rays ☐

Dr. .....

Address .....

Dealer's Name .....

See Page 401 D.D.10
BUFFALO DENTAL MFG. CO.
KEHR & URBAN STS., BUFFALO, N. Y.
Please send me complete information concerning Buffalo Vulcanizers.

Dr. .....

Address .....

Dealer .....

See page 401 D.D.10
EASTMAN KODAK CO.
345 STATE ST., ROCHESTER, N. Y.
Please send me a free sample of *Bite-Wing* Films and a copy of the booklet, "How to Prevent Toothache."

Dr. .....

Address .....

City & State .....

See page 402 D.D.10
COLUMBUS DENTAL MFG. CO.
COLUMBUS, OHIO
Please send free technic book as advertised.

Dr. .....

Address .....

City .....

See page 405 D.D.10
THE J. M. NEY CO.
71 ELM ST., HARTFORD, CONN.
I would be interested to have the reprint mentioned in your advertisement.

Dr. .....

Address .....

City .....

See page 407 D.D.10
THE DENTAL DIGEST
1005 LIBERTY AVENUE, PITTSBURGH, PA.
Please send me a copy of "Dental Oral Surgery," at $10. Send C.O.D. ☐ Send through my dealer. ☐

Dr. .....

Address .....

Dealer .....

See page 407 D.D.10
THE JAS. W. EDWARDS CO.
450 SUTTER ST., SAN FRANCISCO, CALIF.
Please send me the Pacific Dental Gazette-Journal for ☐ 18 months, $1.50. ☐ Remittance enclosed. ☐ Charge through my dealer.

Dr. .....

Address .....

Dealer .....

See page 407 D.D.10
THE PELTON & CRANE CO.
632 HARPER AVE., DETROIT, MICH.
Send complete information concerning Pelton Operating Light.

Dr. .....

Address .....

Dealer .....

"MOUTH HAPPY"

The misfortune of losing natural teeth is greatly minimized for patients who wear Vydon dentures. With properly fitted restorations they enjoy mouth comfort unattainable before the advent of Vydon.

Because it is exceptionally light in weight and never warps or irritates the mouth Vydon causes no discomfort.

It has no taste or odor nor any of the objectionable features which formerly made patients denture conscious. Not even the sensations of heat and cold in eating are changed by Vydon. And it can be kept clean as easily as natural teeth.

Vydon not only allows the patient to forget his denture but he need only glance in a mirror to be assured that no one else is aware of his restoration, even after long usage.

This improved denture base is being worn with comfort and satisfaction by thousands of patients. Try Vydon on your next case.

VYDON

The Denture Base

NRA

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MANUFACTURING CO.

"LOOK FOR THE CRESCENT"
ON ALL OUR TOOTH PRODUCTS
AND AVOID DECEPTION.
OUR TRADE-MARK IS A MARK
OF EXCELLENCE IN TEETH.
THE HIGHEST DEVELOPMENT OF
COLOR-BLENDING, TYPAL FORMS
AND USEFUL SIZES AND PROPORTIONS
IS FOUND EXCLUSIVELY IN

NEW TRUBYTE

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